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Cover

Members of RAAF Williams ARC communicating with STS-37 space shuttle "Atlantis". Pictured LtoR are AC Barry McCormick (Radio Tech adult Trainee), App Adam Gardiner (Radio Trade Apprentice — son of VK3KSF), AC Michael Oliver (communications Op Trainee), FSgt Peter Ormerod (Radio Tech Ground) VK3CPO, App Nigel Gilchrist (Radio Trade Apprentice). See full story on page 22 Photo Crown Copyright used with permission.

EDITOR'S COMMENT

BILL RICE VK3ABP EXECUTIVE EDITOR

Why Be An Amateur?

Writing in the May issue of *Break-In*, Arthur Godfrey ZL1HV asks "Whither amateur radio? Or should it be *Wither?*" Further on, he asks, "Has the magic gone?" and continues, "I think it has. After the age of 10 there is no longer any mystery or excitement about radio communication. From about the age of three the present generation grows up in a world of satellite TV, cellphone systems, cordless telephones, home computers; and, in many cases, is able to use these devices. What fascinated us is now 'ho hum'. CB provides what many want in the way of communication, and there is little incentive to progress further."

The scene in Australia is not much different. We have an amateur population of less than 20,000 and a CB population at least 20 times as great. Why is CB more attractive than amateur radio? I can think of a few reasons:

1. There is no need to pass exams
2. The equipment is relatively cheap
3. There's no problem finding someone to talk to, at least in cities and large towns
4. CB can be used for business purposes.

Arthur says there is little incentive to progress further. As amateurs already, we know there is a great deal of incentive, but to do any good it has to be known by the CBER, or shown by us. What arguments

do we have with the claims listed above?

1. Is there any worthwhile activity, involving many people, which doesn't need passing exams? To drive a car, fly an aeroplane, get almost any decent job. If anyone can do it, with no exam, it's no big deal!
2. Commercial equipment is cheaper, yes. You can't use anything else on CB. But, as a licensed amateur, you can build your own, or update something older and cheaper, because to achieve that licence you learned something about the technicalities of radio. Enough groundwork, at least, to start learning more!
3. This is seldom a problem for amateurs, either! And if and when you progress to HF or satellites, then the world's your oyster!
4. True. Amateur means

what it says; no money-making purpose to the communication. But this is why the whole world accepts amateur radio, simply because it's non-commercial, non-political, friendly conversation.

There are many other ways in which amateur radio gives you more. Bands right through the spectrum, MF to microwaves, not just one or two bands, different in every country. You can work DX legally, almost round the clock, year after year, sunspots or not! You could be in a net with stations from half-a-dozen countries together. Or you can just chat to your mate for hours without one breaker!

Need I say more? Do you know any keen CBERs? Show them this magazine. Amateurs and CBERs don't have to mix like oil and water! With a little more tolerance we might even get to understand each other!

ar

Amateur Radio Service

A radiocommunication service for the purpose of self-training, intercommunication and technical investigations carried out by amateurs, that is, by duly authorised persons interested in radio technique solely with a personal aim and without pecuniary interest.

Wireless Institute of Australia

The world's first and oldest National Radio Society - Founded 1910

Representing the Australian Amateur Radio Service - Member of the International Amateur Radio Union

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WIA NEWS

FROM THE WIA EXECUTIVE OFFICE

International Representation Fund

In the past the WIA has funded international activities on an ad-hoc basis, facing each new demand as it arose. For WARC 79 this posed a problem and some amateurs may remember the intensive fundraising actions which took place at that time. At the 1989 Federal Convention of the WIA, the Federal Council saw the need for more responsible financial planning and set up a more formal approach to international commitments.

The WIA has always had a responsibility to pay annual dues to the International Amateur Radio Union (IARU) Region 3 Association. This has been set at 75 cents per licensed member of the WIA for the current triennium and is an identified component of the Federal membership subscription.

Triggered by the desire to have amateur representation on the Australian WARC 92 delegation, and the need to fund that representation, Federal Council decided to gather together all other international funding commitments in a new component

of the Federal subscription.

In addition to funding travel during the preparations for WARC 92 involvement which, incidentally, started back in February 1990, the fund will pay for the WIA delegation to each IARU Region 3 conference (normally held somewhere in South East Asia every three years), one or more Australian amateurs on the Australian national delegation to WARC 92 in Spain in 1992, WIA attendance at the NZART annual conference every other year and NZART accommodation at our Convention in the intervening years, as well as other international representational activities as they arise.

The WIA is not required, however, to finance the activities of the Australian director of the Region 3 Association,

for this is paid for by the Region.

Federal Council set the international representation component at \$2.00 per full member, and \$1.60 per concess-

Stop Press

DoTC announces new ruling on Third Party Traffic definition.

"Message originated by an amateur and passed to another amateur by a third amateur, whether within Australia or overseas, is no longer considered to be Third Party Traffic."

Full details in next month's *Amateur Radio* magazine.

WIA DIVISIONS

The WIA consists of seven autonomous State Divisions. Each member of the WIA is a member of a Division, usually their residential State or Territory, and each Division looks after amateur radio affairs within their State.

Division	Address	Officers	Weekly News Broadcasts	1991 Fees
VK1	ACT Division GPO Box 600 Canberra ACT 2601 Phone (06) 247 7006	President Christopher Davis Secretary Jan Burrell Treasurer Ken Ray	VK1DO 3.570 MHz VK1BR 2m ch 6850 Rebroadcast Mondays 8pm VK1KEN 70cm ch 8525 2000 hrs Sun	(F) \$67.50 (G) (\$5) \$54.00 (X) \$40.50
VK2	NSW Division 109 Wigram St Parramatta NSW (PO Box 1066 Parramatta) 2124 Phone (02) 689 2417 Fax (02) 633 1525	President Roger Henley Secretary Tim Mills Treasurer David Horstall (Office hours Mon-Fri 1100 - 1400 Wed 1900 - 2100)	(R Denotes repeater) Times 1045 and 1915 on Sunday 1.845 MHz AM, 3.595 AM (1045) SSB (1915 only), 7.146 AM (1045 only) 10.125 SSB (1045 only), 28.320 SSB, 52.120 SSB 52.525 FM 144.12 (SSB), 147.000 FM (R) 438.525 FM (R) 584.750 (ATV Sound) 1281.75FM (R) Relays also conducted via many repeaters throughout NSW.	(F) \$65.00 (G) (\$5) \$52.00 (X) \$38.00
VK3	Victorian Division 38 Taylor St Ashburton Vic 3147 Phone (03) 885 9261	President Jim Linton Secretary Barry Wilton Treasurer Rob Hailey Office hours 0900-1800 Tue & Thur	VK3PC 1.840 MHz AM, 3.615 SSB, 7.085 SSB, 147.250 FM (R) Mt Macedon, 147.225 FM (R) Mt Baw Baw VK3XB 146.800 FM (R) Midura, VK3XLZ 438.075 FM (R) Mt St Leonard 1030 hrs on Sunday	(F) \$69.00 (G) (\$5) \$55.00 (X) \$42.00
VK4	Queensland Division GPO Box 638 Brisbane Qld 4001 Phone (07) 284 9075	President Murray Kelly Secretary Eddie Fisher Treasurer Eric Fittock	VK4AOK 1.825, 3.605, 7.118, 10.135, 14.342, 18.132, 21.175, 24.970, 28.400, MHz VK4ABX 52.525 regional 2m repeaters and 1296.100 0900 hrs Sunday VK4NEF Repeated on 3.605 & 147.150 MHz, 1930 Monday	(F) \$67.50 (G) (\$5) \$54.00 (X) \$40.50
VK5	South Australian Division 34 West Thebarton Rd Thebarton SA 5031 (GPO Box 1234 Adelaide SA 5001) Phone (08) 352 3428	President Rowland Bruce Secretary John McKellar Treasurer Bill Wardrop	VK5OU 1820 kHz 3.550 MHz, 7.095, 14.175, 28.470, 53.100, 145.000, MHz VK5BJM 147.000 FM (R) Adelaide, 146.700 FM (R) Mid North, 146.900 FM (R) South East, ATV Ch 34 579.00 Adelaide, ATV 444.250 Mid North VK5AWM Barossa Valley 146.825, 438.425 (NT) 3.555, 146.500, 0900 hrs Sunday	(F) \$67.50 (G) (\$5) \$52.00 (X) \$40.50
VK6	West Australian Division PO Box 10 West Perth WA 6872 Phone (09) 388 3888	President Cliff Bastin Secretary John Farnan Treasurer Bruce Hedland - Thomas	VK6LZ 146.700 FM (R) Perth, at 0930 hrs Sunday, relayed on 3.560, 7.075, 14.115, 14.175, 21.185, 28.345, 50.150, 438.525 MHz Country relays 3582, 147.350 (R) Busseton 146.900 (R) Mt William (Bunbury) 147.225 (R) 147.250 (R) Mt Saddleback 146.725 (R) Albany 146.825 (R) Mt Barker Broadcast repeated on 3.560 at 1930 hrs.	(F) \$59.00 (G) (\$5) \$47.50 (X) \$32.00
VK7	Tasmanian Division 148 Derwent Ave Lindisfarne TAS 7015	President Tom Allen Secretary Ted Beard Treasurer Peter King	VK7AL 146.700 MHz FM (VK7RHT) at 0930 hrs Sunday relayed on 147.000 (VK7RAA), 146.750 (VK7RWN), 3.570, 7.090, 14.130, 52.100, MHz VK7EB 144.100 (Hobart) Repeated Tues 3.590 at 1930 hrs VK7ZPK	(F) \$65.00 (G) (\$5) \$52.00 (X) \$38.00
VK8	(Northern Territory) is part of the VK5 Division and relays broadcasts from VK5 as shown (received on 14 or 28 MHz).		Membership Grades Full (F) Pension (G) Needy (G) Student (S) Non receipt of AR (X)	Three year membership available to (F) (G) (X) grades at fee x 3 times

Note: All times are local. All frequencies MHz.

sional member, to commence as from January 1989. The amount was arrived at by predicting all likely international expenditure for future years and determining an average figure which would make adequate provision to meet those expected outlays as they arose.

By setting the starting date at January 1989, but allowing that current year's payment to be deferred until the end of 1990, Council aimed to provide an initial balance in the fund to meet the outlays which commenced mid 1990 and to augment the fund nearer the higher outlay dates in 1991/92. In making these decisions Federal Councillors were also aware some Divisions had already been making financial provisions for WARC 92 and saw this approach as a way of dedicating those funds nationally.

To give a feel for the sums involved, the WIA estimates that sending one amateur to Spain for thirty days, accommodating and feeding him in the same hotel as the other members of the Australian delegation, providing a modest sum for incidentals and showing the amateur radio and WIA flag, will cost about \$11,000. You will notice nowhere do we mention recouping lost earnings for the WIA representative whilst away from home. The duty is one of love, which may be able to be done on long service leave.

Since that Federal Council decision in 1989, the WIA has acted to include an amateur in the Australian national delegation to the Joint Interim Working Party (JIWP), held in Geneva for two weeks in March 1991. This action was estimated to cost over \$6000. That decision was made because of the perceived importance of the JIWP, which sets the technical input to the WARC, and was made at the possible expense of only sending one amateur to WARC 92 itself.

The cost of sending a delegation of four to the IARU Region 3 conference in Indo-

nesia during October this year will be around \$9000. Why four you might ask? Well this is very likely the last conference for the WIA team leader and the opportunity is right to expose three new delegates in the international sphere. This chance could not be afforded in 1988, for the WIA did not have financial planning of this nature in place at that time.

The WIA sends two representatives to the NZART conference on alternate years and NZART send two to our Federal Convention in the intervening years. An agreement between associations provides for the host to fund accommodation so the visitor's society need only pay for travel and incidentals. Our representation in New Zealand in June 1991 is estimated at \$1600.

You might ask, is the WIA observing due economies with your funds and are the provisions adequate? To the first, Executive believes so; early purchase economy air travel is used wherever possible, entertainment expenses are kept modest and accommodation is usually arranged at group rates by the host society.

Is the present provision adequate? Executive believes so. The state of the fund is reviewed quarterly and Executive continues to manage international representation within current limits. Even so, after WARC 92 the scheme will be carefully reviewed in the light of future commitments.

DoTC Thanks WIA WARC 92 Team Leader

As previously publicised, David Wardlaw VK3ADW is the WIA WARC 92 team leader, and has attended numerous meetings with the Australian Preparatory Group for WARC 92, as well as attending the JIWP in Geneva in March this year.

An acknowledgment of the valuable work being performed by David, not only on behalf of the Australian ama-

teur radio service, but also as a member of the government team to represent Australia at WARC 92, is contained in a letter received from Mr. D. Hartley, the Acting Assistant Secretary of the Transmission Policy and Spectrum Planning Branch of DoTC.

Dear David,

Thank you for your work in the Delegation to the JIWP and in particular for your assistance in co-ordinating the work on the Spectrum below 1 GHz. The CCIR report and all the associated discussion in Geneva will certainly make a valuable contribution to our further preparation for the WARC.

I look forward to your participation in the delegation to WARC 92.

*Yours sincerely,
D. Hartley*

As you can see, the WIA has respect and credibility with the Australian team for WARC 92, which will help in the fight to retain and gain frequencies for the amateur service.

1991 WIA Federal Convention

Twenty one delegates from the seven Divisions of the WIA and the Federal Executive worked very hard over the weekend of the 20th and 21st April 1991 at the 55th Annual Federal Convention of the WIA. Although much of the proceedings were routine, as is only to be expected at an annual general meeting of a company, a number of important decisions were made over the weekend, details of which will be publicised in coming months.

A highlight of the weekend was the address to the Convention by David Hunt, Manager Licensing, DoTC in Canberra. The WIA had become somewhat disenchanted over the past 12 months with the lack of response by DoTC to a number of outstanding concerns, a state of affairs which is now turning around as a

result of high level representations to DoTC by the WIA in February this year.

As well as increasing the understanding of DoTC by the delegates in a frank address, David answered questions on a variety of subjects without hesitation. He also delivered written responses to the WIA on a number of matters.

Higher Speed Morse Exams

DoTC has advised that, for the purposes of obtaining an overseas amateur station licence, they will accept, through any State or District office, applications for examination in Morse Code at speeds higher than 10 words per minute. The fee for such examination is \$25.00 and documentary evidence is provided to successful applicants.

Callsign Block IAA-IZZ Now Available

Appendix B ("Callsigns") in DOC72 ("Amateur Service - Operating Procedures") lists a number of callsign blocks which have not been allocated to any specific class of amateur. IAA-IZZ is one such block.

Although not allocated, callsigns have been issued from this block to various groups in the past to commemorate the various United Nations declared International Years. The allocation of such callsigns was limited to the IYA-IYZ series.

As many of you will already have heard on air, DoTC has now decided to formally allocate the IAA-IZZ callsign block for use by Unrestricted Amateur Stations. The exception will be the IYA-IYZ segment which will continue to be reserved for International Year commemorations.

Callsigns for Visiting Amateurs

The common practice in many overseas countries is for a visiting amateur, who is

issued with a visitor's licence, to be able to use his home station call sign prefixed by the suffix of the area in which he is operating, for example WB4/VK8XYZ.

Following representation, DoTC has agreed to permit visiting amateurs to utilise their home station call sign in association with their Australian allocated call sign during voice announcements, for example, VK8XYZ/WB4ABC.

DoTC advise that this concession is conditional on the visiting amateur using their Australian allocated call signs first in all transmissions emanating from Australia.

Call signs of Deceased Amateurs

Following the WIANEWS item in April 1991 issue of Amateur Radio magazine, DoTC has re-affirmed its agreement with the WIA to "reserve" a deceased amateur's call sign for a period of two years, with the proviso that the call sign will be re-allocated within that period if the written permission of the family concerned is available.

However, DoTC is concerned that a number of call signs of deceased amateurs are being re-allocated within that two year period because DoTC does not know that the amateur holding the call sign is deceased.

In the normal course of events if an amateur station licence is not renewed at the annual renewal date the chances are that the call sign will be re-allocated within three months of the renewal date.

What is happening all too often in the case of deceased amateurs is that the family do not advise DoTC of the death, and ignore the licence renewal request when it arrives in the post. The result is a re-allocated call sign.

Hawaii Special Event Station

On 11th July 1991 the Big Island of Hawaii will experi-

ence a partial and total solar eclipse from 1630 to 1837Z. Members of the Big Island ARC will man NH6ES from 0001 to 2400Z on 11th July.

The station will be set up in the path of the eclipse at Puako, Hawaii. The NH6ES "Eclipse Station" will be operating in the Novice section of the 10 metre band, and in the general segments of the other HF bands. Special QSL cards will be available for those contacting NH6ES.

Italian QSL Bureau

A note from Mario Ambrosi I2MQP, the Secretary General of the Associazione Radiomatori Italiani (ARI), the WIA's sister society representing radio amateurs in Italy, advises that as from 1st April 1991 the only QSL Bureau for Italy will be as follows:

ARI - QSL Bureau
VIA D. Scarlatti 31
I 20124 Milano MI
Italy

Happy Birthday Sam

The 200th Birthday of Samuel Morse was celebrated by the establishment of two special event stations, V19ISM at the National Science and Technology Centre in Canberra and V191AG Alice Springs, over a period of nine days concluding on Sunday 28th April. Naturally, most of the contacts made were in Morse Code.

As well as providing a unique QSL card for some 800 contacts with V19ISM and 500 contacts with V191AG, the event attracted some very good publicity for amateur radio in the Canberra media.

VK0 QSL Addresses

For rather obvious reasons, the Australian addresses of those amateurs qualifying for a VK0 call sign are not made public. This has caused con-

siderable difficulty for Neil Penfold, VK6NE, the WIA VK9/VK0 QSL bureau manager.

As a result of discussions with David Hunt, Manager Licensing of DoTC in Canberra, DoTC has agreed to assist the WIA in disseminating QSL cards for amateurs operating from Antarctica.

VK0 call signs are only to be issued from the Hobart office of DoTC. Under the direction of Grant Millington in the Hobart office, all future applicants for a VK0 call sign will be asked to provide DoTC with a mailing address for the purpose of forwarding QSL cards for contacts made while operating in the deep south.

These addresses will then be supplied on a confidential basis to the WIA for the exclusive use of the VK9/VK0 QSL Bureau Manager.

Report on 33rd JOTA

Peter Hughes VK6HU, the Australian National Co-ordinator for JOTA, recently forwarded copies of the Australian Copy of the World Report on the 33rd JOTA to the WIA.

This comprehensive report notes that about 85 countries participated in the 1990 JOTA; and that over 10,000 amateurs provided over 5100 stations, at which a total of nearly 385,000 scouts, guides, and cubs, etc. had an intensely active few hours.

JOTA is clearly an international communication event of world standard, and receives publicity for the amateur radio service in a wide range of media.

Have you started your preparations to participate in the 1991 Jamboree of the Air which takes place over the weekend of 19th and 20th October 1991?

Praise for DoTC

DoTC generally collects more brickbats than bouquets from the general public, and

from amateurs in particular, even though not all the complaints heard are justified. It seems to be so much easier in today's society to complain than to compliment.

The WIA is pleased to report the following experience by an American radio amateur on a recent visit to Adelaide as published in KEY KLIX, the newsletter of the Santa Barbara Amateur Radio Club.

"Taking Ruthie in hand I led the way to the offices of the Department of Transport and Communications, Currie Street, 11th Floor. Mr. Bob Baker greeted us at the counter and asked what we might want. A reciprocal licence for Ruth, I answered. No problem - all she had to do was present her US licence and fill out their equivalent of a 610 form. Having done so, Bob said to take the form and pay the cashier while he keyed the data into a computer terminal. Meanwhile, John Kerr, examinations officer came out and introduced himself and also provided us with copies of the VK regulations and information booklets.

Now in the US you'd expect red tape to start snarling up the works. Be prepared for a surprise. Mr. Baker looked up and asked "Do you have any preference for a call sign?" Before Ruthie fainted, I quickly suggested, "Anything with an RG in it would be fine." And in short order KA6SDN became VK5KRG. ... And when we got back to the motel there was a note to call Bob Baker. He'd managed to work the system to accept our Santa Barbara address and would be sending Ruth a corrected licence. Nice people!"

Amateur Radio Magazine Contributions

While articles, technical projects, letters or other items are always warmly welcomed by the editorial staff of Amateur Radio magazine, the thrill of receiving a new item is sometimes diminished by the

effort required to decipher it.

Of late, particular difficulty has been experienced with hand written faxes, which seem to lose a lot in the transmission. As copy must be read by typesetters and proofreaders, as well as the editors, it would be greatly appreciated if contributors made sure that the original articles are clear and legible.

Our volunteers do not have the time or resources to type articles for the typesetters. Diagrams also should be clear enough that they do not need to be interpreted before being redrawn. Less time spent on deciphering means lower production costs and earlier publication of your contribution.

Australian Standards

"The Australian Standard" for April 1991 notes, among many other items, that an updated standard has been prepared for fixed resistors in electronic equipment.

It also notes that standards have been set for the siting of radiocommunications facilities in relation to Fixed Location Satellite Earth Stations. This latter "...proposes recommended practices affecting the operation of the station, with potential interference to signals received or transmitted by the station and the potential impact that radiation emitted from the station could have on the adjacent community. It provides guidelines to organisations and individuals at any level concerned with approval, planning, construction, installation or maintenance of services to be provided at the station."

of services to be provided at the station."

IARU Region III Conference

In a recent issue of Amateur Radio magazine, the WIANEWS column contained the agenda for the coming IARU Region III Conference, to be held in Bandung next October. The WIA has now identified a number of areas in that agenda where a WIA paper should be submitted. To have the maximum impact and chance of adoption, these papers need to be supplied well in advance of the Conference date. This allows their reproduction and distribution to member societies, including those who will not be represented in person at Bandung.

The WIA plans to contribute papers on the following:

- WARC92 preparations,
- Bandplans and band planning issues, including 14 MHz packet frequencies,
- Beacon frequencies and operations,
- DOTS spectrum management,
- Standards Aust, AUSTEL and RF tag devices,
- Satellite matters,
- Intruder watch, including problem intruders,
- Third party traffic update,
- QSL card standards and Bureau services in Aust,
- Packet radio status report

including SYSOPS guidelines,

- * Constitution changes to clarify the status of Association "President" and Treasurer,
- * Guidance on a viable and achievable Association budget,
- * Duration of tenure of office of Directors,
- * The WIA will bid for the next Conference to be held in Australia in 1994.

We have received advance copies of some NZART papers and observe their views are almost diametrically opposed to ours on constitutional changes. Two of our WIA delegates will have a further opportunity to discuss Region III matters with the NZART during their visit to New Zealand in early June.

Do you have any matters which you believe should be aired in this IARU Region III amateur radio forum in October? If so please drop a line to the WIA's IARU liaison officer, Ron Henderson, VK1RH, through the Executive Office and he will research the issue and present it to Executive for inclusion in the WIA brief.

We anticipate the first batch of Conference papers will appear around August. Even though lead times may preclude their publication in full in Amateur Radio magazine, each one will be advised through Federal Tapes. This will allow members to hear what is to be discussed and send in their views, if they so wish, to guide the WIA delegation.

VK9 Callsign Suffixes

For many years, radio amateurs were able to identify the location of VK9 callsign stations by the first letter of the suffix. However, in recent years, due to a number of reasons, this practice was not observed by DoTC in issuing new VK9 callsigns.

As a result of recent WIA discussions with DoTC, David Hunt, Manager Licensing of DoTC in Canberra has now formalised a policy on the issue of VK9 callsigns for use by radio amateurs residing in or visiting the various Australian Territories, in accordance with the following convention.

Christmas Island	VK9X?
Cocos Island	VK9C?
Mellish Reef	VK9M?
Norfolk Island	VK9N?
Willis Island	VK9W?

Limited callsigns issued will consist of the above convention, but with a "Z" inserted between the "9" and the first letter of identifying suffix; similarly, Combined callsigns will have a "K" inserted between the "9" and the first letter of the identifying suffix, and the Novice callsigns will have an "N" inserted in the same place.

This will not be easy for DoTC because it means that all VK9 callsigns will have to be allocated manually, and not through their computer system. However, I am sure that the DX fraternity will be pleased to be able to easily identify the location of some of the rarer VK9 callsigns again. **ar**

Please Don't Do It!

As an active amateur on the bands you have probably accumulated many QSL cards. If ever you have a "clean-out" please don't throw these away. Best to contact the Hon Curator of the WIA Collection and he will visit you.

Maybe you would like to donate some of your own cards.

If in the country or interstate, contact Ken about card consignment (costs are refundable). If looking after a "silent key" estate, please make enquiries of the family whether they wish to donate any QSL cards.

All donations are acknowledged personally and also in AR. Let us save something for history!!

Ken Matchett VK3TLL, Hon Curator, PO Box 1, Seville 3139
Ph: (059) 64 3721

Tragedy in India

Radio amateurs all over the world have been shocked by the assassination of Rajiv Gandhi VU2RG near Madras on 21 May. Our deepest sympathy goes to his widow Sonia VU2SON and family.

Fifty-Fifth Federal Convention

BILL RICE VK3ABP
EXECUTIVE EDITOR

A Little History

THE FIRST FEDERAL Convention of the WIA was held in Melbourne in 1924. Except for 1932, 1940-45, 1954-56, 1958 and 1961, Federal Conventions have been held every year since. The great majority have taken place in Melbourne, although all other capital cities (except Darwin) have hosted the convention at least once. The essential purpose has always been to provide a formal occasion on which all Divisions can discuss administrative matters of common interest. For this purpose each Division is represented by its Federal Councillor, but others may also be in attendance.

As explained last year, the annual convention is not now the only occasion on which all Divisions meet. In 1989 a new scheme was introduced whereby Federal Councillors became members of an Executive expanded from nine to 12 members plus the President. This full Executive now meets quarterly, the intervening monthly meetings being attended mostly (but not only) by members resident in or near Melbourne. Thus the April meeting no longer has a 12-month backlog of business to discuss but, as always, still serves as the Annual General Meeting.

This year on the weekend of 20 and 21 April the venue for the convention reverted to the Brighton Savoy Motel. Executive had no hesitation in deciding that the much higher standard of facilities at the Savoy provided better value for money than last year's venue.

People Present

In attendance from the Executive Office were Bill Roper VK3ARZ (General Manager/Secretary) and Brenda Edmonds VK3KT (Assistant Manager). Executive members (not being Federal Councillors) were Arthur Evans VK3VQ (Treasurer), Peter Gamble VK3YRP (President), Ron Henderson VK1RH (Vice Chairman), Kevin Olds VK1OK, Bill Rice VK3ABP (Executive Editor AR) and David Wardlaw VK3ADW (Immediate Past-President).

Federal Councillors (named first) and observers (where present) were:

VK1 Rob Apathy VK1KRA

VK2 Terry Ryeland VK2UX, Roger Harrison VK2ZTB, John Martin VK2EJM

VK3 Peter Maciellan VK3BWD, Barry Wilton VK3XV (Div Mgr)

VK4 David Jerome VK4YAN, Murray Kelly VK4AOK, David Jones VK4KLV

VK5 Bill Wardrop VK5AWM, Ian Watson VK5KLA

VK6 Neil Penfold VK6NE

VK7 Joe Gelston VK7JG

An apology was received from George Brzostowski VK1GB (until recently the VK1 Federal Councillor). George will, however, remain the Institute's honorary legal adviser. Resignations from Executive were also received from VK4YAN (replaced by VK4AOK) and VK3VQ (replaced on Executive, but not as Treasurer, by VK2ZTB).

Regarding the latter changes, Roger has been for some time the Federal Standards Co-ordinator (replacing Rob Milliken VK1KRM), but the position of Treasurer is once again vacant.

A number of other people were present from time to time during the convention. Notable was David Hunt (Manager Licensing Branch DoTC Canberra) who spoke and answered questions for over an hour on Saturday afternoon, covering a wide range of topics involving both the WIA and the Department.

Other visitors or office bearers present at least some of the time were (in alphabetical order of surname): Leigh Baker VK3TP (WICEN Co-ordinator), Bruce Bathols VK3UV (Past President), John Edmonds VK3AFU (Historian), Ron Fisher VK3OM (Fed Tapes Co-ord), Ken Hanby VK4IS, Harold Hepburn VK3AFQ (former Executive member), Jim Linton VK3PC (Div Pres), Ken Matchett VK3TTL (QSL Collection), Ken Seddon VK3ACS (former Executive member).

Executive Discussion

Because of the new Council/Executive system, a good deal of the convention time was spent in "Executive mode", and in fact the alternative "Council mode" where only Divisions vote (with one vote each) only applied for about four hours altogether. Items dealt with included agreement that the WIA would be represented at the NZART convention (30 May-3 June 1991) by VK1RH and VK3KT, and that the Region 3 Conference at Bandung in October would be attended by VK1GB, VK1RH, VK2ZTB and possibly VK4AOK.

Subsequent to David Hunt's address,

discussion thereon and correspondence received, a number of Executive resolutions were raised to follow-up more favourable DoTC attitudes on such matters as a new Call Book contract, examination protocol, repeater licensing, third-party traffic, reciprocal licensing with Argentina, Philippines, Holland, Greece, Thailand, Vanuatu and Italy, and changes to amateur licensing conditions.

Among the less routine items discussed by Executive prior to the address by David Hunt was the Call Book contract. One feature to emerge was that AGPS, DoTC and WIA policy does not permit the Call Book to be released in "any electronic form". This had resulted from a past attempt by an unnamed organisation to use a computer disk listing to generate a mailing list.

Also notable during this Executive session was a half-hour-plus account by David Wardlaw (our WARC-92 delegate) of his attendance at the Joint Interim Working Party of CCIR at Geneva in March. He suggested there were early indications of pressure on amateur bands at 7MHz, 50MHz, 420-450MHz and 2300-2450MHz. (See David's article on page 24)

By far the most controversial topic(s) to be discussed, both at Executive and Council level, were those which sought to reduce administrative distinctions between Divisions. Motions with this aim in 1990 had been either discarded or deferred. Later in 1990 there was a proposal that some form of non-Divisional membership should be available to federal employees and office-bearers, who could not otherwise work impartially for all Divisions. A model was proposed whereby the Divisions would amalgamate to form a national body (if approved by a majority of members). This was rescinded on the grounds that the model proposed was only one of a number of possibilities, all of which should be explored. A meeting was held at Albury in March, involving Federal, VK2 and VK3 representatives, which resulted in a proposal for a "Commonwealth Division" to which Federal officers and overseas members could belong. This was discussed for about an hour on Saturday afternoon, informally for several hours late on Saturday night, and then for a further half-hour on Sunday morning. The final decision was that a number of

possible models be developed, involving inputs from all Divisions, and presented to the July 1991 quarterly meeting.

Council Business

After almost all of Saturday was spent discussing matters involving the full Executive, it was not until after 4.30pm that the 55th Convention of the Federal Council was declared open. From then until dinner the main business was presentation and acceptance of the various annual reports. Seventeen of these were published in *AR* for last April, and another five were on hand at the convention. Nine were discussed before the last formal item of the day, which was presentation of the Remembrance Day trophy to Peter Maclellan representing VK3 Division, the 1990 winners. The remaining reports were dealt with on Sunday. Few raised any points of contention, although there was some discussion about the financial and the Publications Committee reports, while many contributed to debate on the points raised by the Contest Manager's report. The education report, particularly regarding examinations, also inspired a number of comments.

The remaining council agenda items were the election of Executive office bearers, which reinstated all except for

the resignations and replacements listed earlier. A decision as to the 1992 Federal component of subscriptions was deferred until October, and a proposal to review and update policy statements was approved. The dates for the next convention were agreed to be 2-3 May 1992, and the Council segment of the convention closed at 1215 on Sunday.

Other Items

Reverting to "Executive mode" after lunch, the WICEN Co-ordinator, Leigh Baker VK3TP reviewed progress of

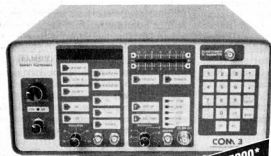
WICEN to date, and some of the problems still apparent. Planning for WARC-92 was reviewed by David Wardlaw VK3ADW, who mentioned that he would be attending five preliminary meetings in the next two weeks! General business items include changes to the Crimes Act regarding scanners and radar detectors, choice of opening speaker for this year's RD Contest (VK2 undertook to negotiate) and arrangements for the July meeting. The proceedings finally closed just after 3pm.

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"Computarock" Receiving Converter

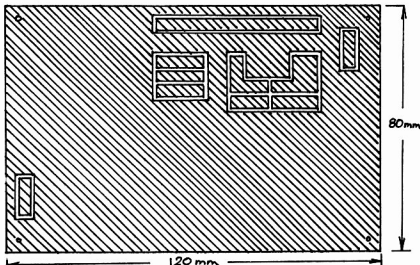
DREW DIAMOND VK3XU
'NAR MEIAN' GATTERS RD
WONGA PARK 3115

DO YOU HAVE A RECEIVER which tunes from 3.5 to 4MHz? Would you like to tune into signals on other bands? Here is a simple converter which will give adequate performance for HF bands from about 5MHz to 22MHz. No bandswitching is necessary, the operator simply selects an appropriate crystal and peaks the input band pass filter on the desired band. In most cases, two bands are accessible for each crystal. Standard "off the shelf" computer crystals may be used to gain access to several amateur bands and many interesting commercial bands (see table).

Circuit

Input signals are routed via a top coupled two-section bandpass filter, tuned by the two-gang variable capacitor C2-C3, and applied to gate 1 of the dual channel FET mixer (there are much better and "stronger" mixers than this. However, the dual gate FET mixer is arguably the best simple mixer available to the amateur. Some conversion gain is provided, very little noise is generated, and dynamic range is adequate for all but the most hostile receiving locations). Conversion gain is such that no additional RF amplification is necessary.

The selected conversion crystal Y is maintained in oscillation by Q2, and the heterodyning signal applied to gate 2 of the mixer. The wanted product will be either $Y-f=4$ (tuning backwards), or



Board Layout

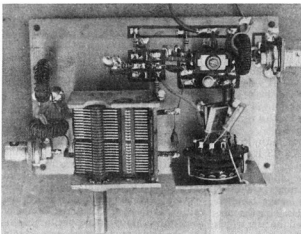
$f-Y=3.5$ (tuning forwards), eg to receive 7.0 to 7.5MHz, we would select an 11MHz crystal; 11-7=4; 11-7.5=3.5, and conversely, 14.5-11=3.5, 15-11=4 and so on. The drain of Q2 has a tank tuned broadly at about 3.7MHz to select these wanted products, link coupled to the 3.5-4.0MHz tunable IF.

Construction

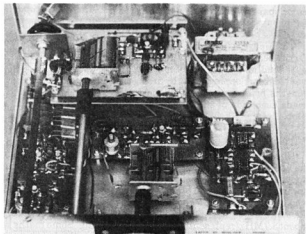
The circuit is uncritical of construction method, and just about any form will

probably work if signal carrying conductors and by-pass leads are kept reasonably short. The prototype is wired upon a home-made etched printed board with the components soldered to the copper tracks as shown.

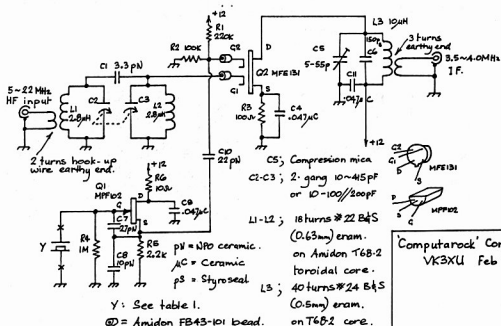
If there is room in the main receiver, the converter may be fitted inside. Alternatively, the converter may be housed in its own stand-alone box to suit, and connected to the receiver via a short coax lead. Perhaps the 12V supply may be



Suggested board layout



The Converter installed in the Super-DC Receiver



'Computerack' Converter:
VK3XU Feb '91.

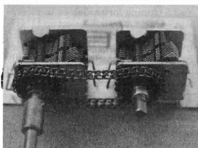
"borrowed" from the receiver also. Only 5mA is required, so a 9V transistor battery would power the converter if no low voltage filtered supply is available.

Only the crystal needs to be changed for each band, so they may be conveniently mounted upon the tags of a two-pole wafer switch to permit rapid band changing. Or the crystals may be simply plugged into a socket. Computer crystals generally have flying leads, so suitable plugs will be required. If you do choose the switch scheme, it is suggested that some spare switch positions be reserved for expansion as other crystals become available.

To suppress parasitic oscillation, a ferrite bead should be installed onto each gate lead as shown. They may be prevented from flopping about by fitting tiny lengths of hook-up wire plastic to the leads each side of the bead, or a small blob of wax.

Fire-up

Check your wiring, and connections for Q1 and Q2. Connect an antenna to the input and apply 9-12Vdc supply. At 7MHz for instance, with an 11MHz crystal you should peak C2-C3 at about mid-travel for strongest signals. Set your receiver to about 3.7MHz (representing 7.3MHz) and peak C5 for loudest band noise or signal.



Alternative capacitor arrangement

Some compromise in setting of C5 may be necessary. If it is planned to do most receiving at the bottom end of the amateur bands (most likely), then C5 could be peaked at say 3.8MHz, leaving adequate sensitivity for the occasions when the opposite end is used (if the idea of twiddling another knob does not worry you, then C5 may be replaced with a variable capacitor of about 100pF).

The image band is obtained by looking for the other peak with C2-C3. It will not take long to get a grasp on the possibilities offered. In some instances where a crystal in the 2-10MHz range is selected, you get a mysterious image band. A harmonic of the crystal is doing the mixing. Some maths will tell the user which band is being received. Naturally, sensi-

tivity is down a bit, but may provide additional useful band exploration.

The two coupled tuned circuits of the filter should peak simultaneously. If there are two distinct peaks, it should be possible to bring them closer together. Alter the inductance of L1 and/or L2 by experimentally bunching or stretching the turns.

Problems

There are no perceived traps for the typical radio/electronics enthusiast. You may get a lazy crystal which will not oscillate. Try inserting a 2.2 or 2.5M RFC in series with the earthy end of R5 — that should give it a kick-start. If you cannot get your converter to work satisfactorily, please write to me about it, and any reasonable amount of assistance will be returned (SASE please).

Parts

The only difficult component is perhaps the dual gang variable capacitor. Persons who have been in radio for some time are certain to have one from an old broadcast set that you may be able to obtain by negotiation. There are now several vintage radio businesses in the cities, and one of these may also be of assistance. Many older capacitors have a 1/8" shaft, so it may be necessary to obtain

or make a reducing coupler.

Shown is an alternative arrangement. Two of the more readily obtainable 100 + 200pF (total 300pF) capacitors are placed side by side. Fitted to each shaft is a Meccano chain sprocket, and these are coupled with a length of chain to obtain the necessary tracking. Some hobby shops will sell Meccano parts individually.

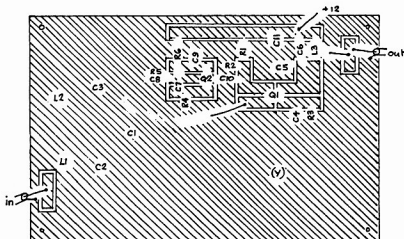
Computer crystals are available from many of the usual electronics shops. Check their lists for best prices, range and availability. Average cost is about \$4.00 each. See Hamads in this journal for suppliers of Amidon cores.

References and Further Reading

1. Converter Tunes 4 to 18MHz, *Najork W5FG, Ham Radio*, May '89
2. *Solid State Design*, Hayward & DeMaw, ARRL
3. White Rose Radio, Hey G3TDZ, *Rad Comm*, Feb '90
4. QRP Classics, ARRL
5. Super-DC Receiver, Diamond VK3XU, *AR*, May '90
6. Modern Receiver Mixers, DeMaw and Collins, *QST*, Jan '81

ar

Remember
to leave a three-
second break
between overs
when
using a repeater



Component locations

Table 1

MHz XTAL	MHz BAND	MHz BAND
2.0	5.5-6.0	-
3.0	4.5-7.0	-
4.0	7.5-8.0	-
5.0	8.5-9.0	-
6.0	9.5-10.0	-
8.0	11.5-12.0	-
10.0	13.5-14.0	-
11.0	14.5-15.0	7.5-7.0
12.0	15.5-16.0	8.5-8.0
14.0*	17.5-18.0	10.5-10.0
15.0	18.5-19.0	11.5-11.0
16.0	19.4-20.0	12.5-12.0
18.0	21.5-22.0	14.5-14.0
20.0	-	15.5-16.0
22.0*	-	18.5-18.0
25.0*	-	21.5-21.0

*Not a known stock frequency at writing

TRY THIS

"Hee Haw" Oscillator

J A HEATH VK2DVH

12A SOUTHDOWN RD ELDERSLIE CAMDEN 2570

The accompanying circuit is for a "hee haw" unit. This makes a sound similar to a police or ambulance siren and could be used as an audible alarm in conjunction with the alarm circuit published in *AR* Dec 1988.

It works as follows:

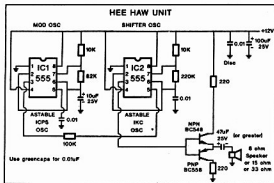
IC1 works as a one-cycle-per-second oscillator

IC2 works as a 1kHz oscillator

IC1 modulates IC2, causing it to shift in frequency

The 555 output is cleaned up and increased in power by the BC548 and BC558 connected as shown. I used an 8ohm speaker, but just about any speaker would do.

I hope you will find the circuit useful.



WT-020-1

Getting Started with Amateur Radio Satellites — Part 5

BILL MAGNUSSON VK3JT
359 WILLIAMSTOWN RD YARRAVILLE 3013

LAST MONTH I DISCUSSED the role of computers in decoding telemetry and predicting antenna pointing co-ordinates. The flavour-of-the-month satellite was Oscar-10, the first of the highly elliptical orbit birds. This month I'm going to look at how you need to upgrade your station to the minimum required to work Oscar-10. I'll then look at 10's elliptical successor, Oscar-13 and describe what you can expect in the way of operating conditions, DX etc.

So far the only antennas mentioned have been 1/4-wave ground planes, 1/2-wave dipoles and small Yagis. If you live in a very quiet location and you're happy working the low-earth orbiters you'll no doubt get satisfactory results using these simple antennas. You may like to try variations like the turnstile or crossed dipole. They represent a worthwhile improvement. The high fliers like AO-10 and 13, however, require somewhat better performance from our antenna systems.

Working the low-earth orbiters involves distances of 2000 or 3000km between you and the satellite. Make that up to 40,000km when AO-10 is at apogee and low on your horizon and you'll agree that if you tried to use a dipole you'd be lucky to even hear a trace of the beacon. If you're going to gamble with these birds you need GAIN.

The first thing to remember is that the satellites have very sensitive receivers and a very quiet receiving location. They can hear you quite well even if you're only putting a sniff of RF at their antenna terminals. I've worked into Oscar-10 at 40,000km with an uplink power, measured quite accurately of 100 milliwatts. I was using a 20-turn helix, one of the antennas I'll be talking about next month. The point I'm trying to make is that it makes a lot more sense to build lots of sensitivity into your receive (downlink) system rather than go for a powerful uplink signal. There is a benchmark to aim for and I'll explain that shortly.

Transponders, being linear devices will retransmit exactly what they hear. If they receive a strong signal it will be retransmitted as a strong signal. If your signal is weak into the device it will appear as a weak signal in the downlink

passband. The benchmark, of course, is the beacon. Every station working the bird should be able to copy the beacon loud and clear. If you can't, you should go back to the drawing board on your receive system before you even try to uplink a signal to the transponder. In fact, you should constantly monitor the beacon frequency to ensure that your signal is **NO STRONGER THAN THE BEACON**. It is logical that it doesn't have to be. It's unfortunate that many signals are heard in the passband with a strength two or more 'S' points louder. Could it be that they are having trouble hearing their own downlink signals so they jack up the power. Consistent offenders become known as ALLIGATORS, (big mouths). Don't become an alligator, it takes a long time to live down a reputation like that. Spend a bit of time on your receive system. Make sure you can hear the beacon. It should be two or three 'S' points above your system noise floor. An excellent test is to listen carefully for the retransmitted transponder noise. This is characterised by a soft woosh, woosh, woosh as the spacecraft rotates about 20 times per minute. If your antennas have three major lobes, and you can hear the rhythmic QSB. If you can hear the transponder noise when the satellite is out near apogee you can guarantee that there is nothing wrong with your receive setup.

Before I look at the uplink setup I want to talk about something called "squint angle". This term was introduced in 1983 by James Miller G3RUH, the author of the now famous Satfoot program, the first graphics program to include a plot of the satellite's footprint on a map of the world. Remember, the footprint is the part of the Earth's surface that the satellite can see. If you are in the footprint you can also "see" the satellite. James also included some calculations in his program to work out which way the satellite is pointing relative to the observer. This printed out as an angle. An angle of zero degrees means that the satellite and, therefore, the satellite's antennas, are pointing right at you. A very good condition for working the bird! A squint angle of 40 degrees means that the satellite antennas are pointing 40 degrees away from you. You can get an excellent idea of

expected operating conditions by watching the squint angle in the predictions. James did us all a power of good when he included this essential element in his program. Of course, all the others are now on the band-wagon. Some of them call it off-pointing angle.

I wanted to introduce you to squint before talking about uplink power, since the two are inter-related. I mentioned earlier my effort with 100 milliwatts. This sort of thing is only possible with minimum squint angle and when the satellite is high in the sky. If you tried to do it when the bird was low on horizon, the atmospheric absorption would force you to increase the uplink power many dB. Perhaps up to 10, 20 or even 50 watts to get a signal back. If the squint isn't good when the satellite is low in the sky and out near apogee, it is sometimes very difficult to get a satisfactory signal through.

By and large, however, the uplink presents much less of a challenge than the downlink. So, let's look at some minimum requirements.

I'll divide this into two sections. This month let's assume that we're interested in getting signals through and having contacts under good squint conditions.

You have probably heard of something called circular polarisation. This is one of the most misunderstood terms in the amateur vocabulary. I'm not going to take it any further this month. I'll cover it next time when we look at maximum performance stations. I'm often asked whether to use vertical or horizontal polarisation when using the Oscars. When you think about it, these terms lose their relevance when you point the antenna up in the air. What's vertical and what's horizontal when the antenna is pointed directly up? There is some evidence to suggest that when the bird is low in the sky, vertical has a slight advantage over horizontal. It is only marginal, however, and is probably offset by the increase in noise pickup by the vertically polarised antenna.

Talking in terms of boom length, remember the gain of a Yagi depends more on this than any other factor. You should not contemplate a Yagi of less than two wavelengths for either uplink or

downlink. Since the easiest transponder to work on AO-10 and AO-13 is mode B, we are talking about a 4m long Yagi on 145.9MHz for downlink, and a 1.5m long Yagi on 435.1MHz for uplink. Ten or 12 elements should do the trick. The DL6WU design is hard to beat.

The antennas should be mounted at each end of a horizontal boom. You can make the boom of wood. Give it a good coat of raw linseed oil and mount it on a short pole or tripod. You can work out a hinge mechanism of some sort to allow elevation as well as azimuth pointing. The pole need not be high at this stage. We aren't expecting to work the bird under adverse conditions when it's low on horizon. And you need to be able to set the azimuth and elevation by hand.

With 10 to 50 watts on 435.1MHz this should suffice for your uplink system. The downlink, well that depends on how good your receiver is on 145.9MHz. My suggestion is that you try it and see. If you are getting a reasonable signal from the beacon (when the squint is good) then

have a go. Try your uplink and see if you can receive the downlink signal. If you can, then straightaway turn down your power until signal is the same strength as the beacon.

If you can't hear the beacon very well, check your program again for a time of better squint. If you still can't hear the beacon very well, then you will have to improve your receive setup. I'm going to talk about preamps next month. If you have one already and want to use it, make sure you mount it right at the antenna terminals. Even your very best bit of coax will introduce some losses.

You should have noticed when you were working RS-10/11 that if you moved your transmit frequency up a few kHz that the downlink frequency also moved up by the same amount.

You should also have noticed that the frequencies kept drifting apart somehow. This is due to the differing rate of Doppler shift at the two locations. Oscars 10 and 13 mode B use the higher frequency of 435MHz. The Doppler shift at 435MHz

is three times as much as at 145MHz. It would be very difficult indeed to control this situation unless something was done. Well, it is done. Mode B transponders invert the whole passband.

That means that if you uplink towards the bottom of the passband, your signal will come out near the top of the downlink passband. Also, if you want your signal to appear as a USB signal on downlink (that's usual) then you need to uplink a LSB signal on 435MHz. Why make it so complicated? This is done to counteract the Doppler shift. It doesn't completely overcome it, but it makes operating a breeze. When the bird is out near apogee you only have to make frequency corrections every few minutes during a contact.

Due to Oscar-10's problems, which I discussed last month, it's rather difficult to work unless it's close in to Earth. Try your station when either Oscar-10 or Oscar-13 are around an hour or so either side of perigee. Then you can look further into the orbit to find the limits of your station. **ar**

Cutty Sark Race

The Pembroke Radio Society will be running a special event station for the Cutty Sark Tall Ships Race. It will be held for the first time on the Milford Haven waterway, Pembroke, Wales.

The Milford Haven waterway is one of the most famous in the UK, having the distinction of being the second natural deep-water anchorage in Europe, also having three oil refineries, two docks and several marinas, all in and around the waterway, to mention just a few. It also has one of the oldest histories, dating back to the Megalithic era of around 2000BC.

The Cutty Sark Tall Ships Race runs from 9-14 July 1991, with a proposed sail past of all the entrants on the Haven on 14 July before heading out to sea for the start. The ships should start arriving from the 7th or 8th, maybe even before. We are hoping for some 60 ships to be in the Haven, from some 18 countries. And the Cutty Sark committee is expecting almost a million visitors over the period. So, it will be a big thing!

Our station will be run from 1 July for 28 days under the callsign GB2TSR (Tall Ships Race), and should be great fun to run and to take part in. The station will be from a caravan in the lower car park of the British Legion, Hamilton Terrace, Milford Haven. This will give us a great view of the Haven, both up and down stream.

We would like as many contacts as possible on all bands and modes, so give us a call on the air.

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Propagation of Long Radio Waves

Part 1

JOHN ADCOCK VK3ACA
12 ALBERT STREET, OAK PARK 3046

THE MAIN PURPOSE of this article is to present textbook-type information on the basics of propagation on frequencies between 100 kHz and 200 kHz. Why should people be interested in such an unusual and restricted band of frequencies? Basically because some amateurs in several parts of the world have operated in this region, and if an amateur band is ever allocated in the low-frequency spectrum, it is in this region that such a band would be allocated. Therefore, it is important that interested persons should understand operating conditions on these frequencies.

For some time now, I have been thinking of presenting this article on the subject of low frequency or long wave propagation, but have been deterred somewhat by the difficulty of presenting a clear overall picture. This difficulty is not helped by the apparent lack of suitable references to fill in the picture. I have come to the reluctant conclusion that a lot of gaps in knowledge do exist in the subject, and I will point these out at the end of the article.

As far as I know, no attempt has ever been made before to explain LF propagation in concise terms with the average interested reader in mind, and to point out where it differs from HF propagation. It is, therefore, hoped that this article will become a basic reference for amateur radio on the subject of LF propagation.

There is an enormous amount written on the subject of HF propagation for both the amateur and the professional. This is very well presented for the amateur in texts such as the ARRL Handbook and many others. The subject of LF propagation has been around for a long time, and is covered in great detail in technical books and papers on the subject, but is not covered in amateur radio texts.

Part 1: The Basic Physics of Propagation

Introduction

Propagation of electro-magnetic waves from the longest radio waves through to light waves is affected by the same physical laws, but the physical nature of the media through which the waves pass varies with frequency. The differences are brought about by many different factors, for example, the inertia and

movement of charged particles in the ionosphere when acted upon by fields of different frequency.

Propagation of low frequency or long electromagnetic waves (long radio waves) is dependent upon surface waves and, as with HF, waves reflected between the ground and the ionosphere, but their play in the propagation process is quite different from that at the high frequencies. At low frequencies the combined effect of ground and ionospheric reflections results in a wavefront at the surface of the earth similar in character to a surface waves, as we shall see later. This similarity has given rise to the popular misconception that "low frequencies propagate around the earth by ground wave propagation".

In general, the propagation of low frequency radio waves is quite different from high frequency. In fact there is nothing similar in any bands at present held by amateurs. Even propagation at 160 metres is more similar to HF than LF. There are many misconceptions about LF propagation, and it is intended to explain all these things here.

Basic Concepts

In this article it is proposed to use the "light" analogy frequently. Reflection and refraction at light frequencies are exactly the same as at VHF, HF and low frequencies — only the scale changes. To put the two in real terms, the wavelength of red light is a little less than one micron or 10^{-12} metres. In frequency it is about 400 terahertz or 400×10^{12} Hz. This is about 30,000,000 times the frequency of 14 MHz.

Electromagnetic waves at any frequency normally propagate in straight lines, but are bent around curves by the process of reflection, refraction or diffraction. These three processes are the basis of radio propagation.

For the purpose of this article, I refer to HF as the band of frequencies mainly between six and 30kHz, and I refer to LF as the band of frequencies mainly between 10 and 200kHz. Ten to 30kHz is correctly VLF, but in this article I use the term LF or low frequency — a general term covering the general type of propagation to be described.

Refraction

This process is well known to anyone who has studied physics at school, so the effects will be described briefly. An electromagnetic wave of any frequency will travel slightly slower in a medium, such as air, than it will in a vacuum. The amount by which a wave front is slowed down in a medium is dependent upon its "refractive index". In light, this is also known as "optical density", but the process is the same at radio frequencies as at light frequencies. In general, the higher the actual density the higher the refractive index. A vacuum has a refractive index of one, air has a refractive index of about 1.0003. Substances like glass or water are much higher. Cold air has a slightly higher refractive index than warm air. *Refractive index is directly related to permittivity or dielectric constant* and this is particularly important in respect of the ionosphere, as we shall see later.

The effect of a wave front, travelling

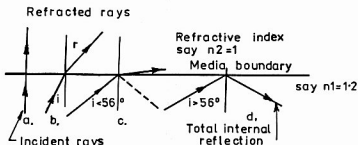


FIG. 1

through a plane that separates media of different refractive indices, is that the wavefront will change its direction at the plane. This is illustrated in Figure 1. When there is only a small change in refractive index, substantial bending will take place only when the direction of travel of the wave front has a small angle to the plane. Examples of refraction of light are well known. In radio there are many examples of refraction. Some examples are bending of VHF waves when they cross a cold front (HF waves are similarly affected although the effect is not as noticeable). Another example is that of the atmosphere, which decreases in pressure and hence refractive index (although the change is very small) with height, and this has the effect of making the horizon distance look farther than in a vacuum. Yet another example of refraction in radio would be the bending in direction of an HF wave as it passes through the ionosphere, as shall be discussed in some detail below.

The bending that takes place when an electromagnetic wave passes from one medium to another is based on the formula —

$$\frac{\sin i}{\sin r} = \frac{n_2}{n_1} \quad (1)$$

where i is the angle of incidence and r is the angle of refraction, n_1 is the refractive index of the first media, and n_2 is the refractive index of the second medium.

It is important to note that, when dealing with bending of a wave direction at a change of refractive index, the change does not have to be at a plane surface. If the change in refractive index is gradual over a distance, then the bending will take place gradually. This will be dealt with in more detail under total internal reflection.

Reflection

Reflection has taken place at a plane, or virtual plane, when the wave front travelling towards the plane at an angle to the perpendicular, or normal to the plane, is turned (or reflected) away from the plane at the same angle to the normal. "The angle of incidence equals the angle of reflection" (see Figure 2). Also the incident ray, the reflected ray and the normal to the surface at the point of reflection all lie in the same plane and on the same side of the surface. If the surface is uneven and the irregularities are large as compared with a wavelength, the wave front will be reflected in several directions at once, resulting in "scattering". A poorly reflecting surface can result in "loss".

There are two basically different types of reflection.

1. Reflection that occurs at a plane surface is known in physics as "regular or

specular reflection" and which we will refer to here as "plane surface reflection".

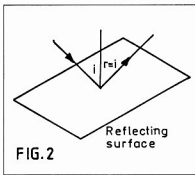
2. Reflection that occurs when a wave travels from a medium of high refractive index towards a medium of lower refractive index. This process is known in physics as "total internal reflection".

There are numerous examples of both these types of reflection in radio waves, as we will see in the article.

1. Plane Surface Reflection

This, too, can be divided into two basic types, they are:

1. Reflection at a plane metallic



surface. There are no examples of this in nature, but there are plenty of man-made objects for both radio and light using metallic reflectors. These are very familiar to the average amateur and require no explanation.

2. Reflection at either a dielectric surface or a lossy resistive surface. In order for useful "regular" reflection to take place several properties are required. There must be a surface or discontinuity between the two media. Irregularities on the surface must be small as compared with a wavelength; the smaller the irregularities the better the reflection. Conversely, the lower the frequency the better the reflection. The change or discontinuity between the propagating medium and the reflecting surface should be as sharp as possible. That is, a discontinuity which consists of a gradual change in refractive index over many wavelengths will not produce regular reflection, but it may produce total internal reflection, as we shall see shortly. The sharper the discontinuity the better the reflection. The greater the change in dielectric constant or, in some cases, magnetic permeability (both affect refractive index) and/or conductivity the better the reflection. The lower the angle of the incident ray to the discontinuity surface the better the reflection. Re-

flexion can take place when the discontinuity is either of higher refractive index or lower refractive index than the medium of the incident wave. When reflection takes place, only part of the wave is reflected. Some is lost and some may pass through the surface and propagate in a different direction (refraction).

Reflection at plane surfaces is easy to see with light. When light strikes the surface of a plane sheet of glass with an unsilvered surface, the light is better reflected at a low angle to the surface than at a high angle, and not all the light is reflected. Some passes through the glass. If the surface of the glass is rough, scattering takes place and less light is reflected. A similar effect is observed if the surface is dirty. If the surface of the glass was not hard but slowly merged into the air similarly, reflection would be reduced or eliminated. This is not easy to demonstrate with glass, but the effect is very important when dealing with atmospheric and ionospheric effects. An important point to note is that a plane reflector can have quite a poor surface and, in fact, have practically no reflective effect for a vertical incident ray but have quite a good reflective property at a very low angle.

In radio, the best example of plane surface reflection of this type is the reflection of radio waves by the ground, and this displays all the properties listed above. Sea water, which has a higher dielectric constant and better conductivity than soil, is also a better reflector. In fact, water will reflect all waves from radio to light frequencies. Soil will only produce regular reflection at radio frequencies where the irregularities are small compared with a wavelength, hence the longer the wavelength (the lower the frequency) the better the reflection.

2. Total Internal Reflection

This form of reflection is a direct result of refraction. In some amateur articles recently it has incorrectly been referred to as refraction. The term is, therefore, a bit misleading. It differs from ordinary refraction or just bending in that the wave is turned around completely and comes out of the reflecting medium at the same angle as it entered. It fulfils all the requirements of reflection given above. See Figure 1. Total internal reflection takes place if the sine of the angle of incidence times the ratio of the refractive index of the first medium to that of the second is greater than 1.

In mathematical terms, and by transposing formula 1:

$$\text{if } \frac{n_1}{n_2} \sin i > 1$$

then $\sin r$ is greater than 1. There is no angle for a sine greater than 1 and r is unreal — reflection then takes place.

As a simple example of the above, suppose $n_1=1.2$ and $n_2=1$. Then, if the angle of incidence is $i=30^\circ$ (60° to the surface), the angle of refraction $r=36.8^\circ$. If $i=60^\circ$ (30° to the surface), $\sin r=1.04$. Refraction cannot take place and the wave is reflected (see Figure 1). The critical angle occurs when $\sin i=1/1.2$, therefore $i=56^\circ$.

The old physics term of "total" internal reflection is based on the notion that this reflection takes place inside the higher density media and is not caused by the surface. It is, therefore, lossless. The term "total" is slightly misleading. The reflection loss may in theory be zero but the media through which the electromagnetic wave passes certainly may be lossy.

Total internal reflection, which is the direct result of refraction, differs from plane surface reflection in several major ways. Total internal reflection takes place only when a wave moves from a medium of higher to one of lower refractive index. Like refraction, this reflection can take place over a considerable distance where the refractive index changes very gradually. This is completely different from plane surface reflection as described above. In the case of the ionosphere, bending and ultimate reflection may take place over a distance of thousands of wavelengths; see Figure 3. (If the boundary between the two media is sharp and the angle of incidence is too small for total internal reflection, plane surface reflection and refraction may take place, see the dotted line in Figure 1c.

An example of light being reflected by this process at a diffuse surface would be that of a mirage or reflection from heat haze on a road. This is the same as reflection of VHF radio waves from a temperature inversion.

Diffraction

In some ways this is the most mysterious characteristic of propagation, but it is certainly very important at low frequency. It is a characteristic of all wave motions (even waves on water) that you cannot have a sharp edge to a wave beam. If you try to, the edge of the wave pattern

Another example would be where a laser beam is projected at the moon — the spot on the moon is a lot larger than would be expected from the radiation pattern of the source. On an ocean island, waves come in on every side of the island even though the waves out at sea may be travelling in one direction. In radio, waves

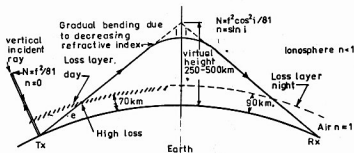


FIG. 3 HF Ionospheric reflection

will generate new waves which, in effect, causes the beam to "spread out". The theory is that every point on the edge of a beam (of light, radio waves or even ocean waves) acts as new source of waves. The sum total of all these sources is to produce a beam that spreads out at the edges.

The effect is observed when light is projected at a very small hole; the hole will tend to become a source of light.

bend beyond the horizon, and this is the basis of ground or surface waves. The larger the wave the bigger the corner the wave will bend around. In other words, the effect is a matter of scale.

This effect therefore becomes more significant the longer the wavelength, and will be dealt with particularly under low-frequency propagation.

(To be continued)

The Marconi Spirit

Some years ago, Dr W A S Bute-met VK3AD told me the following story during a business trip to the WRE in VK5. (VK3AD is now an SK).

Bill was studying in London, going for his PhD when he had regular CW QSOs with his high school friend in Wellington, who was the son of the then Prime Minister of ZL.

His friend asked Bill one day to go to the House of Commons in London and observe the debate on a certain matter, which would be of great importance to his father, and if he could obtain and pass on the information via

QSO before anyone else in ZL could have it.

Bill did as asked by his friend, and the Prime Minister surprised not only his opposition with the knowledge obtained when the people of ZL were still asleep — even the usually alert press was now guessing.

But a few days later Bill received a letter from the Marconi Company saying: "Dear Sir, it has come to our knowledge that you have used amateur radio to communicate with New Zealand in a way contrary to the regulation on amateur radio, and the communication used is a monopoly of the Marconi Company. We

must insist that you will refrain in the future from this activity, which would result in serious consequences.

We understand that you are studying for your PhD in radio communication at London University. We would like to assist you in your work. Please contact Mr, who will give you radio components — you can select — which you would find hard to obtain otherwise.

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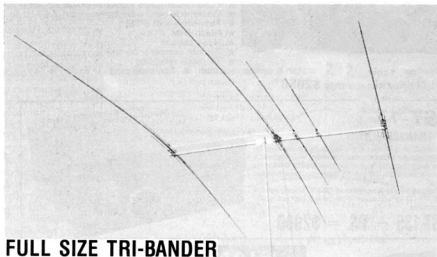
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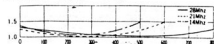
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The Story of Steven Frith

KARL SAVILLE VK5AHK
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Meningitis

RECENTLY A FRIEND ASKED me if I could help a very badly disabled person communicate with a computer. The disabled person, Steven, now 26 years of age, had been stricken with meningitis when he was one year old. This had left him unable to talk, and unable to control his arms or legs. His only means of communication was his eyes. He would open them wide for yes, and close them tight for no. There was no way, as far as I could ascertain, he could operate a computer keyboard, but I found that he could operate a switch with his chin, although with difficulty. His coordination was not good, and his body would go into uncontrolled muscular spasms at any moment. He would then be unable to get on or off the switch for up to 30 seconds or so. And control of the computer would have to be made through this single pole chin switch.

I decided to teach him the Morse code and, much to my surprise, he mastered it in less than a month. He would practise for at least three hours a day, and I would leave him perspiring from determination and effort. And what a lift it gave him. Today, two years later, he is more confident and able to express himself.

Computer

His computer program includes a word processor, a vocabulary of some 100 phrases, a four-function calculator, drawing program and some six games, including Pacman, Four in a Row, Noughts and Crosses and Snakes and Ladders. The constant use of the chin switch and the concentration required have greatly improved his control and coordination, and he is improving all the time.

His computer is a Microbee and the programs have been put into four EPROMS. Because the Microbee has a battery backup it is always ready to go as soon as his nurse switches on the mains power.

During the initial stages of this exercise I began to realise how good the Morse code was. Certainly Samuel Morse was more than a pretty face, if it was he who invented the code. Take the letter E, for example. In the average English text the letter E is used more than any other letter (in fact, almost twice as often), and

it is represented by the smallest piece of information in the code, ie a dot. The next most used letter is the letter T, represented by a dash.

I was looking through a back copy of the *Scientific American* recently and came across a list showing the frequency distribution of letters in an average English text. This is listed in column 1 of the Table, and the percentage of use in column 2.

Columns 3 and 4 list the Morse code in increasing order of information, that is value of dots and dashes plus spaces. For example, the numeric value of the letter R is 7. One for the dot, one for the space, three for the dash, one for another space, and one for the last dot.

At the time I was interested in a Morse code recognition program where each letter of the alphabet is represented by a unique number. The system I finally arrived at was akin to the binary code. The value of each dot, or dash, depends on its position in the sequence. In the case of

the dots, the first one is counted as one. The second dot value is two, third position is four and the fourth 8. The letter H, for example, with four dots, is numbered $1+2+4+8 = 15$.

The dashes are numbered, two for the first position, four the second, eight for the third and 16 for the fourth.

With mixed dot and dash letters care has to be taken to number according to the position the dots, or dashes, are in. Take the letter C as an example. The first element is a dash and, being in the first position, its value is two. The second element is a dot and, because it is a second-position dot, its value is two. The third element is a dash, and a third-position dash value is eight. The fourth element in the letter C is a dot, and a fourth-position dot is eight, making a total of $2+2+8+8 = 20$. Using this system, it is fairly easy to make up a computer program to count the dots and dashes of a Morse code letter and decode it from its count number.

A simplified system was used for numbers. One dot = 1, and so on up to five dots for 5. One dash = 6, and so on up to five dashes for 0.

Columns 5 and 6 list the letter code system in increasing counts for the 26 letters. Column 6 starts with one for the letter E, to a 21 count for the letter P. There is a gap at number 22, and two other gaps at 25 and 27, there being no Morse letter to fill these. Not all of the possible four-element codes are used for letters: the missing code signals are — with a count of 22, .-. for 25, and .- for 27. There is also one more, — making a total count of 30. These gaps, or unused numbers, came in useful, and were used for a CLEAR, DELETE and SPACE facility in the word processor used by Steven.

You will notice that the most used letters in the alphabet have the lowest number ratings, and there is a general agreement between the three lists. This must prove something. Did the code authors have automatic reading machines in mind?

Further Possibilities

There are many disabled people in the community who would benefit from the Morse and computer skills that exist in the amateur ranks. One young lady whom I know of could move only one finger and

Let- ter	%	Morse Code	Computer Code
E	13	E 1	E 1
T	9	T 3	T 2
A	8	I 3	I 1+2 = 3
O	8	N 5	N 2+2 = 4
N	7	A 5	A 1+4 = 5
I	6.5	S 5	M 2+4 = 6
R	6.5	R 7	S 1+2+4 = 7
H	6	H 7	D 2+2+4 = 8
S	6	D 7	R 1+4+4 = 9
D	4	M 7	G 2+4+4 = 10
L	3.5	U 7	K 1+2+8 = 11
C	3	V 9	W 2+2+8 = 12
M	3.25	F 9	U 1+4+8 = 13
U	3.25	L 9	O 2+4+8 = 14
F	2.25	B 9	H 1+2+4+8 = 15
P	2.25	K 9	B 2+2+4+8 = 16
Y	2	G 9	L 1+4+4+8 = 17
B	2	W 9	Z 2+4+4+8 = 18
G	2	O 11	F 1+2+8+8 = 19
W	2	Y 11	C 2+2+8+8 = 20
V	1.5	X 11	P 1+4+8+8 = 21
SPACE 22			
J	1	Z 11	V 1+2+4+16 = 23
K	1	P 11	X 2+2+4+16 = 24
SPACE 25			
X	1	C 11	Q 2+4+4+16 = 26
SPACE 27			
Q	0.5	Y 13	Y 2+2+8+16 = 28
Z	0.5	Q 13	J 1+4+8+16 = 29

Table of Letter Usage Frequency

Technical Correspondence

Z-Match Assessment

THE STANDARD Z MATCH IS NOT a good aerial matching unit, and the Ronny version (AR March '90) is not as good as the standard.

The G5RV modified version, scorned by Ronny in March '91 AR is better because it helps "iron out" the wide variations of loaded Q, which is an inherent characteristic of the basis L network and its Z match derivative. The Q of the Ronny version, as tested by Lloyd Butler (AR Dec '90) varies with load and frequency from a low of 0.28 to a high of 8. Is that good? That is, with resistive loads, the unit will not match some common reactive aerials.

The above is supported by my theoretical analysis of the Butler tests. Copies of my worksheets are available on request; include a SAE. The theory is ARRL hand-book level.

The Ronnies are guilty of "loose talk" about aerial gain with respect to a dipole. Which dipole and where? Why not use the isotropic (point) source as the reference? That theoretical reference field is always $\sqrt{4\pi^2}$ watts per square metre or $(30P)^{1/2}/r$ volts per metre. If that seems simple and unambiguous — it is. P is the aerial power, r is the distance in metres from the source.

For more information read the G3VA column in *Radio Communication*, Feb '91.

(The second point, about aerial gain, was referred to the Two Ronnies. They indicated a preference for dipole reference rather than isotropic in that the latter is a theoretical concept, rather than a practical aerial. Ed)

Supplementary Z Match Information

The analysis and tests of the Z match by VK5BR in the May '89 and Dec '90 issues of AR overlook some useful information. This paper is a supplement to those excellent papers.

The input to the Z match presents to the transmitter a series resonant circuit comprising C_1 , a resistance equal to the transmitter design load and an inductive reactance equal to the reactance of C_1 . The Q of that equivalent circuit is —

$$Q_{\text{loaded}} = X_{C_1}/R = X_{C_1}/50 \dots (1)$$

Useful information can be derived from that basic statement, eg From Lloyd's Dec '90 paper at Fig 3.C, is 160pF for a load of 200ohms at 7MHz. Therefore the loaded Q is 2.84 and

assuming a TX output of 100 watts

The PD across C_1 is 200 volts,

the PD across C_2 is 212 volts.

Choose C_1 and C_2 to withstand those potentials, plus a safety factor.

The network beyond C_2 must be equivalent to an inductive reactance,

equal to the reactance of C_1 , in series with a resistance of 50 ohms. For the above 200 ohm load example, the equivalent inductance is 3.23μH. That is larger than the actual circuit inductance — very puzzling. To add to the confusion, calculate the inductance required to resonate with other C_1 values extracted from the graphs at Figs 2, 3, 4 and 5 of Lloyd's Dec '90 paper (see notes).

The low loaded Q, calculated above, is less than the ideal, but helps achieve good efficiency —

$$\text{Efficiency} = (1 - \text{loaded } Q + \text{unloaded } Q) \times 100\%$$

The parallel equivalent circuit of the input can be calculated using a series/parallel transformation and, as Lloyd points out in his May '89 paper, that forms, with C_1 , the ubiquitous L network for matching a resistive load to a lower resistance source. The statements for calculating the L network components are included in the opening para of the May '89 paper, these can be simplified by replacing R_L with $N R_L$ N must be greater than unity (see refs 1 and 2). The result is —

$$X_1 = N R_L / (N - 1)^{1/2} = 50 N / (N - 1)^{1/2} \dots (2)$$

$$X_2 = R_L / (N - 1)^{1/2} = 50 / (N - 1)^{1/2} \dots (3)$$

From (3), $N = 9.08$ when $C_1 = 160\text{pF}$ and the equivalent parallel circuit is 454 ohms in parallel with an inductive reactance of

The Story of Steven Frith (Continued from Page 19)

she could not talk. Some thoughtful person realised that she might be able to operate a Morse key and taught her the Morse code. She astounded everybody with her skill and ability with the code and computer, and became a very clever person. I have made multiple choice programs for Steven to find out what he knows. I started off with very simple questions like "Mary had a little —", and he had to indicate which box out of four was the correct answer.

I was agreeably surprised at his general knowledge. He knew where the Pyramids were, for example. I found out that although he was taught to read, he had little spelling skill, but we are working on that. There are many of these unfortunate people in homes and institutions, and all they need is someone to show them the way. The staff and nurses who

look after them are usually overworked and unskilled in the use of computers, and it can be far too expensive for their families to get professional help.

Computer programs usually have to be written specifically for the needs of a particular individual, and this can be very expensive. And so it has to be left to volunteers. I can assure amateurs that there is no greater reward than to see a disabled person write something on a computer screen to tell you what he thinks, something he has been unable to do before.

The computer can open up a wonderful new world for the disabled, with access to hitherto unlimited fields of knowledge.

I belong to the Technical Aid for the Disabled, or TAD for short. We have branches in every state and need volunteers with computer and electronic knowhow to help these people. Perhaps you might like to join us?

ar

Single Chip Video Camera

Researchers at Edinburgh University, Scotland, have put all of the technology for a video camera onto a single silicon chip. The camera-on-a-chip is less than 10 square millimetres in size. It has an array of 80,000 light sensors and the electronics to control and process the signals they produce, and the chip includes a camera lens. So far the chip produces only black and white images, but work is continuing on a colour version which could be turned into a cheap hand-held video camera.

In its current form it will be used in a surveillance camera — with video toys and other consumer electronic wizardry expected to follow.

160 Ω hms (3.63 μ H). The parallel equivalent of the series combination — 50 ohm and 2.23 μ H is the same.

With a TX input of 100 watts, the PD across 454 ohms is 212 volts.

The coupling networks L_1/L_2 and L_1/L_4 can be analysed using the network of fig 6 in the May '89 paper. I prefer statement (4) below because one less series parallel transformation is needed for a parallel circuit analysis, and it provides more direct information of the effect of secondary impedance.

$$Z_2 = Z_1 + jX_{12} \{ R_2 / (R_2^2 + X_2^2) - j(C_2 / X_2) \} \{ R_2^2 + X_2^2 \} \quad (4)$$

X_{12} is the mutual reactance of circuits 1 and 2

Z_1 is the impedance of circuit 1 with circuit 2 open

R_2 is the load resistance

X_2 is the total reactance of circuit 2.

For the 200 ohm 7MHz example ($L_1 = 2.52\mu$ H, $L_2 = 2.28\mu$ H, $M = 1.53\mu$ H) the equivalent series circuit is 18.1+j102 we are looking for 50+j142. The equivalent parallel circuit is 590 ohms in parallel with 2.38 μ H — we want 454 ohms in parallel with 3.63 μ H. N is 11.8, not the 9.08 predicted above. The differences might be attributed to measurement errors of L and K.

There are better matching units — easier to design and with more predictable performance. I advise prospective owner/builders to use statement (4) to determine the effect of complex loads before deciding to go ahead. Note that if X_2 is zero, the coupled impedance is a resistance. It might be an advantage to resonate the load with post L_2 or L_4 reactance.

Addendum

Another word of caution — the original (W1CJL) version was used as a valve PA tank circuit. These are high impedance sources and there are problems in adapting the idea for 50 ohm sources. Various writers have condemned the unit as unsuitable for 50 ohm sources, and Louis Varney (G5RV) recommends his modified version described in *Radio Communications* Oct '85. I recommend a study of that paper.

It is a curious fact that all writers have avoided a complete mathematical analysis to support their statements. Lloyd's analysis in both papers has significant omissions; not the least of these is the puzzle mentioned above.

Note: Copies of my calculation worksheets are available for anyone interested — these contain more detail including the effect of reactive loads and the answer to that puzzle.

References:

- (1) The Lazy Pi-L Lawless AR Jul '86
- (2) Topical Technicalities — L Lawless AR Mar '88

(3) Analysis of the Z Match — Lloyd Butler AR May '89

(4) Tests on the Compact Z Match — Lloyd Butler AR Dec '90

(5) An improved Z Match ASTU — Louis Varney Rad Com Oct '85

LINDSAY LAWLESS VK3ANJ
BOX 112 LAKES ENTRANCE 3909

Lindsay Lawless & the Z Match

As the previous articles by VK3ANJ both refer to my own two articles on the subject, I have been given the opportunity to comment on what he has said.

Lindsay has offered an alternative formula for calculating the L network values and a formula for deriving the reflected impedance components at the primaries of the coupling coil networks. He has also made use of some of the results I obtained in my December 1980 article to do some calculations.

He has taken a sample from my article of a 200ohm aerial load requiring an input capacitor C1 value of 160pF. He has pointed out that the shunt inductance required (3.23 μ H) is greater than the coil inductance and he has quoted this as being a puzzle. He also stated that lack of analysis of this puzzle in my earlier May 1989 article was (to quote) "a significant omission". Well, I did explain this in my earlier article. If you place a capacitor in parallel with an inductor, the current through it is in antiphase to that through the inductor and the combined circuit can be made to look as though it is an inductor of higher value than the inductor on its own. The higher value of inductance is tuned by the setting of the capacitor which, in the Z match unit, is capacitor C2. Hence C2 is really the shunt inductance adjuster. A diagram with supporting conversion formula (figure 5) was included to illustrate the principle. So where is the puzzle and the omission?

In his letter to the editor of 8.3.91, he declares that the Z match is not a good aerial matching unit. His only support for this declaration is that the loaded Q varies over the tuning range and he has quoted figures he has worked out as ranging from 0.28 to 8. Referring back to his article, he has given us the well-known formula for efficiency.

$$\% \text{ Efficiency} = (1 - \text{Loaded } Q / \text{Unloaded } Q) \times 100$$

Now the coils in the Z match units have dimensions which could well be expected to deliver a Q of say 150 as a typical value. The unloaded Q is largely dependent on the coil Q and, using the figure of 150 for unloaded Q and Lindsay's figures of 0.28 to 8 for loaded Q, we calculate efficiencies ranging from 99.7 per cent to 95 per cent. On these figures we hardly have an efficiency problem. Of course the coil Q var-

ies with frequency, but even if this falls to as low as 50, the efficiency calculations still give us a tolerable figure. There is not much of an argument against the Z match here, so what else is there?

Tank circuits in the output of class C or single-ended class B RF power amplifiers need a controlled value of loaded Q, a compromise between minimising harmonics generated in the pulsed tuned circuit (requiring high Q) and achieving high efficiency in the tank circuit (requiring low Q!). However, our Z match tuner is not a tank circuit, its function being to transform a complex load impedance to a specific resistive impedance load. Desirable loaded tank Q in a transmitter is in the vicinity of 10 or 12. As given by Lindsay, the loaded Q of the Z match is generally much lower than this, and hence it hardly performs any function of improving the waveform coming from the transmitter. I guess there is some confusion in that the present Z match tuner seems to have evolved from a similar earlier system in which the circuit was also the tank of a valve power amplifier. In that circuit, the value of loaded Q would have been important.

All in all, the Z match tuner has a lot of attractive features. I outlined these in my December 1990 article. Bench tests on the Ronny unit showed it up in a very good light and it seems to perform well in the field, matching up to all sorts of odd lengths of wire. I must say that Lindsay will have to come up with more convincing arguments before he can persuade me that there is something drastically wrong with its design.

Concerning Lindsay's comments about writers avoiding a complete mathematical analysis, I think he should bear in mind that this is an amateur radio journal, not the proceedings of a professional engineers society. As technical writers we are amateurs who try to do the best we can at a level we hope will suit our average reader.

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Communications Link with Space Shuttle

RAAF Williams and STS-37 "Atlantis"

HARRY STOCKDALE VK3TGE, PETER ORMEROD VK3CPO,
WITH BRUCE KENDALL VK3WL

THE RAAF WILLIAMS AMATEUR Radio Club VK3APP, situated at Laverton, Victoria, has chalked up another first for the Royal Australian Air Force.

The club, which was re-formed in October 1990, has become the first RAAF club to communicate successfully with an orbiting spacecraft.

Members of the club discovered that the recent Space Shuttle mission STS-37 (Atlantis) included a program designed to allow Australian school students to talk to crew members of "Atlantis" during the mission. Three orbits were dedicated to the program. These were orbits 14, 29 and 59, with one station each from the west, central and east Australia participating on each pass.

The club made application on behalf of the RAAF School of Radio at Laverton to participate in the program and was successful in its application. A total of only nine stations/schools throughout Australia were able to take part in the trials. These were VK6KAE/Northampton, VK5AGR/Adelaide, VK3APP/Laverton, VK6FT/Geraldton, VK3YXK/Geelong, VK2EMU/Hurstville, VK6BMD/Perth, VK3CFI/Colac and VK4JON/Innisfail.

VK3APP was allocated orbit 14, our window of which occurred just 18.5 hours after launch, at 2125 local on Saturday, 6 April 1991.

In the days leading up to the launch, members of the club monitored "Voice of America" transmissions and the AMSAT AUSTRALIA net to determine the exact time of "lift off". When the launch was confirmed, computations were run to determine accurately the time for our allotted window.

Students from the School of Radio chosen as representatives to make the attempt included two radio apprentices, one adult trainee and a communications operator trainee.

Each of the representatives was required to attend a club meeting prior to the attempt to discuss the radio procedures that would be used during the contact (and to work out what they were going to say to the astronauts).

At this point, orbit 13 was taking place, and one of the astronauts, Ken KB4AWP, put out a call "is there anybody down

there?", to which a reply was sent from VK3APP. To the best of our knowledge at this stage, a two-way QSO did take place confirming that our station was working satisfactorily.

The shuttle traversed the night sky from west to east at an altitude of approximately 450km and at a distance from Laverton of around 1200km. From horizon to horizon the pass lasted only 10 minutes. Of that time, only five minutes were available for the attempt.

As Atlantis rose above the western horizon, it could be clearly heard talking to the VK6 station, and then the moment that we had all been waiting for, "Victor Kilo Three Alpha Papa Papa this is KB5AWP Atlantis calling, do you copy".

The station operator chosen for the attempt, Peter Ormerod VK3CPO responded to the call and then passed the microphone to apprentice Nigel Gilchrist to carry on the contact.

During the contact, Wing Commander Val Robinson the Commanding Officer of

the RAAF School of Radio, listened intently as his students created a little history.

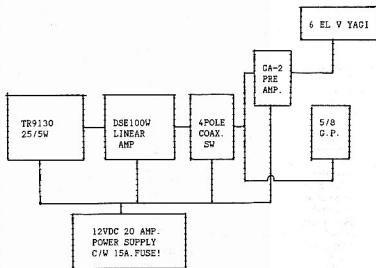
At about this time Murphy entered the fray. Prior to orbit 13, Peter VK3CPO had operated with a TR9130 feeding five watts into a DSE 100-watt power amplifier. Receiver input was via a Kuranishi Instruments GaAs FET GA-2 preamplifier. This equipment line-up appeared to be working fine. During the interval between orbits 13 and 14, Murphy #1, in the form of the owner of the power amplifier (we know who he is!), turned this piece of equipment OFF. When it was our turn to QSO with Atlantis, Peter VK3CPO presumed that the station configuration was as he had left it after the orbit 13 contact.

The following rapid sequence of events then occurred:

— The first couple of attempts to make contact with "Atlantis" took place with only 5 watts from the TR9130. As a result, we were not heard.

— At some time during the next few

Primary Station



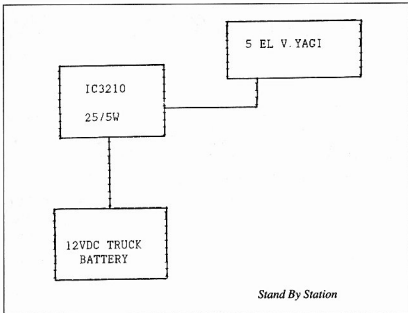
tries the TR9130 was accidentally switched to 25 watts (bear in mind that prior to and during the attempt Peter had no fewer than four television cameras and many microphones from the media contingent on all four sides of the operating position, which would have heightened the adrenalin flow somewhat).

— Not long after this, Peter noticed that the linear was OFF and immediately switched it back on, but, in the heat of the moment, did not turn the 2m transceiver back to the 5W power setting. Thereafter, Ken KB5AWP on board "Atlantis" could certainly hear us! But not for long.

— For a couple of overs we had near perfect two-way communications. Information about our club and that four students were asking questions was relayed.

— Enter Murphy #2. The 20-amp power supply only had a 15-amp fuse in the secondary line! This was unknown to us at the time and didn't cross anybody's mind as it had not been cause for concern during any of the prior test transmissions.

— With the 2m transceiver 25 watts, the linear (100W?), and the preamp all drawing just a little bit of current, the 15-amp fuse decided, space shuttle or no



space shuttle, it was time to pull the pin and blow!

At this point, Peter, who quickly rose to the occasion, transferred operation to the standby equipment. This consisted of an Icom IC-3210 and a 12V truck battery (no power supply problems here!).

Apprentice Nigel Gilchrist finally got to ask Ken some questions, and received a reply just prior to the shuttle disappearing over the horizon.

The five astronauts aboard "Atlantis" were Steve Nagel N5RAW, Ken Cameron KB5AWP, Jay Apt N5QWL, Linda Goodwin N5RAX and Jerry Ross N5SCW.

The station equipment for this attempt was as follows:

Primary station: Kenwood TR9130 52/25W, DSE 100W linear, Kuranishi Instruments GA-2 GaAs FET preamplifier, 12VDC 20A power supply, six-element vertically polarised Yagi antenna at 60 feet and a $\frac{1}{4}$ s ground plane antenna at 20 feet.

Secondary station: Icom IC3210 5W/25W, 12VDC battery, five-element horizontal polarised Yagi at 55 feet.

Despite the mixed success of the at-

tempt, a two-way QSO did take place and it was a valuable learning experience for all concerned.

The media coverage that was gained for our hobby was invaluable and again demonstrated to the general public what amateur radio is capable of achieving.

Steps are also being undertaken to ensure better success, if there is a next time. At the least, the club will end up with an improved OSCAR station. In addition, every skerrick of equipment will be checked inside and out before the event. Remember Murphy's Law.

The RAAF Williams Amateur Radio Club meets each Friday evening at 1930 EST at RAAF Williams, Laverton Base Victoria. Visitors are most welcome and enquiries should be directed to: FltLt Harry Stockdale VK3TGE, tel 368 2295, WOFF Mick Lindsay VK3ZMN, tel 368 2547, FSgt Peter Ormerod VK3CPO, tel 368 2266, or Bruce Kendall VK3WL, tel 741 1127.

The club net is conducted on 147.800MHz FM every Wednesday at 2000 EST.

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Preparation for WARC-92

BY THE INTERNATIONAL RADIO CONSULTATIVE COMMITTEE (CCIR) OF THE ITU

DAVID WARDLAW VK3ADW

WIA WARC CO-ORDINATOR

THE CCIR HAS BEEN SET THE task of producing a report which is to provide the technical and operational basis for the work of WARC-92.

As additional funds were not made available for the CCIR to have its usual preparatory meeting to prepare the CCIR report, it was necessary for the needed preparatory work to be done through the CCIR study groups, which already have a heavy ongoing workload of technical studies covering all aspects of radio communication.

To produce the CCIR report which was to go to the World Administrative Radio Conference to be held in 1992 a Joint Interim Working Party of all CCIR study groups was formed, known as JIWP WARC-92.

There are 10 CCIR study groups, each dealing with specific radio services or particular aspects of radio communications. For example, Study Group 8 deals with the Mobile and Mobile Satellite Services, Amateur and Amateur Satellite Services and the Radio Determination Service; and Study Group 4 deals with the Fixed Satellite Service.

In order to cover these items on the agenda of WARC-92 and to provide material for JIWP WARC-92, a number of interim working parties (IWPs) were set up. In the event of more than one study group being involved, they were called Joint Interim Working Parties (JIWPs).

The meetings of these JIWPs and IWPs forwarded their output material to the CCIR, which used it to make up the draft report that JIWP WARC-92 was to consider.

Work of JIWP WARC-92

The Draft Report, along with 65 other submissions from various administrations and international organisations which suggested modifications to the Draft Report, was considered by the participants at the JIWP.

After having finished their consideration of all documents put before them, the delegates to the JIWP agreed on the substances of their report to be forwarded to the WARC.

The 11-man Australian delegation to the meeting, which included WIA representative David Wardlaw VK3ADW, was led by DoTC and covered a wide range of spectrum users.

The total participation was over 300 from 34 countries.

Fourteen international organisations and seven scientific or industrial organisations. This was a much greater number than was expected.

There were seven countries from Region 3 represented: Australia, China, Iran, Japan, Korea, New Zealand and Singapore. There were four countries from Region 2. The remainder were from Region 1 and then mainly Europe.

Amongst the delegates were 33 amateurs from 14 countries in all continents except South America (there were only three delegates from one country from South America).

The chairman of the meeting was Mr Murray Hunt of Canada.

The JIWP was split was three working groups (WG)

WG1 Matters below 1GHz
WG2 Matters between 1GHz and 3GHz (the heaviest load)

WG3 Matters above 3GHz
David Wardlaw was appointed co-ordinator within the Australian delegation for matters concerned with WG1.

WG1

There were four main issues that were dealt with by WG1.

1. High Frequency Broadcasting
2. Low Earth Orbiting Satellites
3. Wind Profilers (Doppler radars firing vertically which are able to detect atmospheric wind changes)
4. Extra Vehicular Communications in Space Using Frequencies Around 400 MHz.

The chapter dealing with HF broadcasting emphasised the need for broadcasting to change to SSB in order to maximise the use of the spectrum.

The characteristics of the amateur service and its family of frequencies and sharing problems were maintained in the report without alteration from the original which was derived from two earlier working parties. The IARU had presented input documents to both IWPs/15 (dealing with mobile matters and also including the amateur and amateur satellite service) and JIWP 10, 6, 3, 8/1 (dealing with HF broadcasting and sharing by other services in the HF spectrum) on behalf of the amateur service. The material for these documents was pre-

pared by amateurs in USA, UK, Australia and Poland.

This working group had by far the greatest volume of documents to deal with. It was the WG that covered the main items on the agenda for WARC-92 such as Satellite Sound Broadcasting, Land Mobile Satellite, the Radio Telecommunications Service and Public Correspondence from Aircraft (by satellite).

Although this was not a frequency allocation meeting, the amount of spectrum required for new uses was estimated and sharing criteria developed (this may mean no possibility of sharing). Also, preferred parts of the spectrum were indicated, where propagation, path losses and other features would be optimum.

Pointers are that the 2300-2450MHz amateur band is at risk. Currently the amateur service shares it with other services in such a way that world-wide amateurs have access to it to some extent or other (eg the USA has 2300-2310MHz and 2390-2450MHz). Australian amateurs share the band with Multipoint Distribution Services.

The seriousness of the investigations in this part of the spectrum is emphasised by the fact that interference levels from microwave ovens etc in the 2450+-50MHz Industrial Scientific and Medical (ISM) band are being looked into. In the past communications services were just warned that there was no protection in ISM bands.

To date there is no pressure on the 1240-1300MHz band.

WG3

Above 20GHz we should maintain our bands as none of the frequencies looked at for High Definition Television (HDTV) involves any amateur bands.

Threats to Amateur Bands

The other main threats to amateur frequencies are at 7MHz in Region 2 from HF broadcasting, and at 70cm from wind profilers. The wind profiler people are also interested in a frequency around 50MHz (as well as at 1000MHz, but this does not affect amateurs).

Low Earth Orbit mobile satellites are looking at spectrum on either side of the 2m band.

Continued Page 51

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 "I found the receiver in the FT-1000 to be astonishingly sensitive and immune to cross modulation on all bands." — ARA

Transmitter — SSB

"In SSB operation, the FT-1000 is easy to adjust and use... The processor adds quite a bit of punch to SSB signals; hams I worked on SSB with the FT-1000 gave me good audio quality reports." — QST
 "Reports were all very favourable, especially when using the speech processor." — AR
 "...reports of my transmitted audio were very good, even with the RF processor turned up..." — PW

Transmitter — CW

"CW keying was a delight...power output was checked in the CW mode and found to be well in excess of 200 watts on all bands..." — AR
 "On CW the FT-1000 was absolutely faultless." — ARA
 "CW operation with the internal keyer is a breeze... In QSK CW operation, the rig has well shaped and weighted keying." — QST

Transmitter — RTTY/Packet

"Using the set on HF packet was an absolute pleasure..." — PW
 "RTTY and packet radio operation with the '1000 are straight forward..." — QST
 "Packet and RTTY modes were tried and proved just superb." — ARA

Conclusion

"Yaesu's latest 'Flagship' transceiver clearly lives up to its name..." — PW
 "...the FT-1000 represents unbeatable value..." — AR
 "It is an excellent set worthy of accolades and rave..." — ARA
 "...the FT-1000 needs little for me to consider it the ultimate contesting and DXing machine available today..." — QST

The FT-1000's combination of Direct Digital Synthesis, high output power, ultra-high performance receiver, and easy to use controls put it far ahead of the competition. Wouldn't you rather be using the "Best of the Best"?

Cat D-3200

2 YEAR WARRANTY

\$4995

including MD-1 desk mic

Magazines

ARA — Amateur Radio Action Vol. 13, No. 2
 AR — Amateur Radio August 1990
 PW — Practical Wireless January 1990
 QST — ARRL QST March 1991 (review with optional filters fitted)
 Copies of these and other reviews plus our 12 page colour brochure are available upon request. Phone (008) 226610 or (02) 8882105.



VHF BARGAINS



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The all-mode, portable transceiver for serious field or mobile operations! The FT-290RII features FM, SSB (USB/LSB), and CW operation with 2.5W or 250mW switchable output power, twin VFOs, and 10 memories that store mode and simplex or repeater frequencies. Selectable tuning rates are provided for SSB/CW and FM, while mode specific features such as a noise blanker and clarifier control for SSB/CW, plus a full set of functions for FM repeater operation make these units very simple to operate. Each unit comes with an FBA-8 battery holder for nine C size standard or NiCad batteries (not supplied), antenna, and handheld microphone.

FT-290RII with flexible rubber antenna covers 144-148MHz.

Cat D-2875

SAVE \$50 ON 1990 PRICE

\$699

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FT-4700RH DUALBAND MOBILE FM TRANSCEIVER

Features 50 watts output on 2 metres, and 40 watts output on 70cm (430-450MHz), with Full-duplex crossband operation or dual-band reception modes provided, so you can listen for calls on both bands simultaneously, or work someone on one band while also listening on the other band. The **BONUS** YSK-4700 extension cable allows the main body of the transceiver to be installed remotely, while the front panel mounts conveniently on the dashboard. On the front panel the amber back-lit LCD shows both VHF and UHF frequencies and signal strengths, and all controls are back-lit for clear readability, with a dimmer switch for nighttime viewing. A total of 20 memories and 5 selectable tuning steps make frequency selection easy, while the advanced scanning features allow quick detection of signals on either, or both bands. See ARA review Vol. 12 Issue 11 (Feb 1990), or A.R. review May '89.

Cat D-3300

- BONUS •**
- YSK-4700 front panel extension cable
 - 2m 3/4" mobile antenna
 - 70cm co-linear mobile antenna



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FT-736R VHF/UHF BASE-STATION TRANSCEIVER

The FT-736R is Yaesu's BEST VHF/UHF transceiver! Designed for the serious VHF/UHF operator, this high-performance transceiver provides 25W output (SSB, CW, FM) on the 2 metre and 70cm (430-450MHz) bands, and can be easily expanded to also cover the 6 metre and 23cm (1240-1300MHz) bands as required. Features include keyboard frequency entry, 115 memories, 2 independent VFO's per band, separate FM Channel knob with selectable channel steps, 2 full duplex VFO's for Satellite operation, IF shift and Notch filters, noise blanker, all-mode VOX, SSB speech processor, GaAs Fet front-ends (430, 1200MHz), high stability TCXO reference oscillator, & an in-built AC power supply. Microphone optional extra.

Cat D-2920



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DICK SMITH
ELECTRONICS

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VERY LIMITED STOCKS!

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MORE FEATURES FOR YOUR MONEY!

FT-411E 2M HAND-HELD

Superb performance on the 2M band with all of the 'top-of-the-line' features and reliability you know you can expect from Yaesu! Don't be fooled by unknown brands which can only offer some of these features...

- 144 to 148MHz transceive operation, with enhanced receiver performance
- Ultra long life 1000mAh NiCd battery pack
- 2.5 watts RF output as standard, up to 5 watts with 12V DC (or FNB-11)
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- Carry case, belt clip, approved AC charger
- **2 Year Warranty!**

Cat D-3350

*** Now with enhanced receiver sensitivity, and improved strong signal handling!**

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THE AMAZING FT-470

Hand held performance at its best! The FT-470 represents the pinnacle of high-tech design in compact hand helds providing both 2m and 70cm coverage in one.

2.3 watts on the 2m and 70cm bands with the latest multi-tasking microprocessor control allows a high degree of flexibility. In fact, several functions can be performed simultaneously - including 'dual-band' reception, as well as 'full duplex' operation!

That's right, you can be talking through your local 2m repeater and scanning channels for your next 70cm contact at the same time.

There are also 21 tuneable memories and 2 VFO's per band, plus inbuilt C.T.C.S.S. (Tone Squelch, encode/decode) with paging facility, a variety of scanning facilities, LCD display showing 5.5 frequency digits on both bands at the same time, and an LCD bargraph signal/P.O. meter. The programmable 'power saver' system helps maximize battery life, and frequency selection via tuning knob or direct keyboard entry is a standard feature. Comes complete with an ultra long-life 1000mAh NiCad battery pack, carry case, dual band antenna, and an approved AC charger.

Why buy 2 hand-helds when you can have everything in one?

Cat D-3360

See A.R.A. review Vol 12, Issue 5, or A.R. review Aug '89 issue.

2 YEAR WARRANTY!

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PLEASE CONTACT YOUR LOCAL STORE FOR
STOCK AVAILABILITY, OR ORDER BY PHONE...

AWARDS

PHIL HARDSTAFF — FEDERAL AWARDS MANAGER VK3JFE/FKITS
PO Box 300, SOUTH CAULFIELD, Vic 3162

IRCS

You will probably read elsewhere in this issue a letter from Frank Macklin VK1ZL regarding his experiences with IRCS. I would just like to thank Frank for his letter and would like to finish with IRCS for a while by just summarising that they are in fact worth \$1.20 to redeem, and if you have any problems tell the person behind the counter to look at section 10.23 of their regulations.

WAVKCA

I received a batch of WAVKCA certificates this week from the printer and will be busy for the next few nights trying to clear the backlog. So, if you know someone who is waiting for one, they should have it by the time you read this. Contrary to what I stated a column or two back, they were printed on heavy paper and had a slight change of colour, with the slightly yucky green being replaced with a light shade of blue. The basic design has been retained, but the colours look much better.

Ukraine Contest Club

This award will be presented to qualifying radio amateurs throughout the world. The basic award is granted for valid contacts with 10 members for stations outside Europe and 20 members for stations in Europe. Seals (stickers?) can be earned for higher total contacts.

Bronze	—	15
Silver	—	20
Gold	—	30

No QSL cards are needed. Contacts may be any mode 1.8 to 30MHz. For an award, send a verified list of contacts with five IRCS to:

Awards Chairman
PO Box 4850
ZAPOROZHIE
330118
Ukraine
USSR

List of Members of Ukraine Contest Club

RB4JF, RB4MF, RB5AA, RB5CB, RB5FH, RB5IM, RB5JX, RB5MF, RB5PE, RB5QRQ, RB5QW (President), RB5SA, RB5TK, RB5VT, UB3MP, UB4MM, UB5IFZ, UB5LF, UB5MD, UB5MW, UB5PA, UB0QQ, UB0QZ, UT4UW, UT4UZ, UY5EG, UY5ZM, UY5OO, UB3IWA, UB4CWW, UB4IXZ, UB4ZML, UT4UXW.

Moorabbin and District Radio Club — Moorabbin Award

I recently received a copy of the new and simplified rules for this award from Alan Dobie VK3AMD. Alan tells me that the certificate is 30cm by 20cm and is attractively coloured

green and blue with black lettering on heavy cream cartridge paper. The award shows a map of Port Phillip Bay with main cities and country centres marked in.

Moorabbin Award Rules

1. This open award is available to any licensed amateur who has submitted evidence of two-way contacts with M & DRC Station (VK3APC) and/or member stations (identifiable by callsign); and to any SWL who submits evidence of having heard contacts between amateurs and member stations.
2. Contacts may be made on any band and any mode.
3. The award is issued on a point-scoring system: club members — 20 points required; non-club members — 15 points; SWLs — eight points; overseas stations — five points or one contact with the club station (VK3 APC).
4. Awarding of points is based on the following schedule for each contact.

Mode of Contact

Station	Phone	CW	Packet	RTTY
VK3APC	3	10	7	5
M & DRC	1	5	5	4
Member				

Stations may be worked only once per band, per mode. A separate award may be claimed for each mode qualified for.

5. Contacts made as from 1 June 1983 on are valid for award points.
6. Proof of contact to be by log extract showing date, time (UTC), callsign of station worked, frequency, mode of emission, signal report and point claimed.
7. Applications for award to be sent to the:
Awards Manager
PO Box 88
East Bentleigh Vic 3165
Together with a fee of \$3.00
8. The M & DRC holds a regular club net on 3.567MHz each Monday night at 8.00pm local time.

ar

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in order to
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radio frequencies
at WARC '92

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A Call to all Holders of a Novice Licence

Now you have joined the ranks of amateur radio, why not extend your activities?

The Wireless Institute of Australia (N.S.W. Division) conducts a Bridging Correspondence Course for the AOCF and LAOCF Examinations.

Throughout the Course, your papers are checked and commented upon to lead you to a successful conclusion.

For further details write to:

The Course Supervisor
WIA
PO Box 1066
Parramatta NSW 2124
(109 Wigram Street, Parramatta)
Phone: (02) 689 2417

11am to 2pm Monday to Friday
7 to 9pm Wednesday

CONTESTS

(INFORMATION PROVIDED BY THE
RELEVANT CO-ORDINATORS)

As a result of recommendations accepted by the 1991 Federal Convention, several changes have been made to future contests.

The one with the greatest impact is: "Entrants to the RD contest to submit a summary sheet instead of a log".

However, any log may be called up by the contest co-ordinator, to prove the summary sheet.

For the VK/ZL contest, certificates will be awarded to the top scorer in each country, if there are more than five entries from that country. If less than five entries from that country, scores of more than 500 points will receive a certificate.

Five recommendations were accepted for the Ross Hull Contest, and these will be advised later this year.

Points obtained in the six-hour section of the John Moyle Field Day do not count towards the overall HF contest trophy.

Neil VK6NE

Federal Contest Co-ordinator

The 32nd All Asian DX Contest — 1991

Supported by the Ministry of Posts and Telecommunications of Japan.

1. Contest period: "Effective 1991, date of AA DX contest has been

(1) CW: 48 hours from 0000 UTC the third Saturday of June to 2400 UTC next day (15-16 June 1991)

(2) Phone: 48 hours from 0000 UTC the fourth Saturday of September to 2400 UTC next day (7-8 September 1991)

2. Bands:

Amateur bands below 30MHz (except 10, 18, 24MHz)

3. Entry Classifications:

(1) Single operator, 1.9MHz band (CW only)

(2) Single operator, 3.5MHz band (including 3.8MHz band)

(3) Single operator, 7MHz band

(4) Single operator, 14MHz band

(5) Single operator, 21MHz band

(6) Single operator, 28MHz band

(7) Single operator, multi band

(8) Multioperator, multi band

4. Contest Call:

(a) CW ... "CQ AA"

(b) Phone ... "CQ Asia"

5. Exchange:

(1) For OM stations: RS(T) report plus two figures denoting operator's age

(2) For YL stations: RS(T) report plus two figures "00 (zero zero)"

6. Restrictions on the Contest:

(1) No contact on cross band

(2) For participants of single operator's entry: Transmitting two signals or more at the same time including cases of different bands is not permitted

(3) For participants of multioperator's entry: Transmitting two signals or more at the same time within the same band is not permitted, except in case of different bands

7. Points and Multipliers

(1) Contacts among Asian stations and among non-Asian stations will neither count as a point nor a multiplier

(2) (a) Points ... Perfect contact with Asian stations (excluding US auxiliary military radio stations in the Far East, Japan) will be counted as follows:

1.9MHz band 3 points

3.5MHz band 2 points

Other bands 1 point

(b) Multipliers ... The number of different Asian prefixes worked on each band, according to the WPX Contest rules. Example: JSABC/7 will count for prefix JS7.

8. Scoring:

(The total of the contact points on each band) x (The total of the multipliers on each band).

9. Instructions on the summary and log sheet:

It is recommended to use JARL AA contest logs and summaries which are available from HQ for one IRC and SAE.

(1) Each summary sheet must include your DXCC country, call used, entry class, multipliers by band, points by band and total score. It should also include a signed declaration indicating that you have observed the rules and regulations of the contest.

(2) Log sheet must contain band, date, time in UTC, call of station worked, exchange sent, exchange received, multipliers and QSO points. Use a separate sheet for each band. Multipliers should be clearly marked by countries or Asian prefixes, first time worked on each band.

10. Awards:

(1) For both Phone and CW, certificates will be awarded to those having the highest score in each entry in proportion to the number of participants from each country and also those from each call area in the United States.

(a) The number of participants under 10.....

Award only to the highest scorer.

(b) From 11 to 20.....

Award up to the runner up.

(c) From 21 to 30.....

Award to the top three

(d) From 31 or more

Award to the top five

(2) The highest scorer in each continent of the single operator and multi-band entry will receive a medal from JARL and certificates from the Minister of Posts and Telecommunications of Japan.

(3) The highest scorer of the multi-operator multi-band entry in each continent will receive a medal from JARL.

11. Reporting:

(1) Submit a summary sheet and logs of only one classification.

(2) The log and summary should be postmarked by the following dates addressed to JARL: All Asia DX Contest, PO Box 377, Tokyo Central, Japan. Indicate Phone or CW on the envelope.

(a) CW 30 July 1991

(b) Phone 30 September 1991

12. Disqualifications:

(1) Violation of the contest rules.

(2) False statement in the report.

(3) Taking points from duplicate contact on the same band in excess of 2% of the total.

13. Announcement of Results:

(1) CW ... About February 1992

(2) Phone ... About April 1992

14. Countries List of Asia.

A4	JT	VS6	3W, XV
A5	JY	VU	4S
A6	OD	VU (Andaman & Nicobar Is)	4W, 4Z
A7	S2	VU (Laccadive Is)	58
A9	T2-A8	XU	70
AP	UA9, 0	XU	8Q
BV	UD	XW	9K
BY	UF	XX9	9M2
EP	UG	XZ	9N
HL	UH	YA	9V
HS	UI	YI	J2(Abu
HZ	UJ	YK	Al, Jabal at Tair)

JA	UL	ZC4
JD1	UM	15 (Spratly Is)
		(Ogasawara Is)

• You may receive contest results by enclosing one IRC and SAE with your log.

Australasian Sprints CW and Phone July 1991

The Adelaide Hills Amateur Radio Society Inc is pleased to announce that the sixth series of the annual Australasian Sprints will be held during July 1991.

Both of these contests, which are for CW and phone operators respectively, and are of one-hour duration on 80m, are open to all appropriately licensed amateurs in VK, ZL and P2 call areas. As in past contests, a section is provided for SWLs.

The Australasian Sprints are endorsed and co-sponsored by the South Australian/Northern Territory Division of the Wireless Institute of Australia and the Adelaide Hills Amateur Radio Society, and certificates and

trophies will be awarded to call area winners and overall winners. This year, a certificate will be awarded also to the highest scoring novice class operator in the CW sprint only, provided that this entrant is not entitled to another award for the CW sprint.

The reasoning behind the concept of the Australasian Sprints is simple. Most contests are long with fairly complex rules, and participation, except by serious contestants, is tending to diminish. The Australasian Sprints, being of only one-hour duration, are quick and simple, challenging but fun.

Object of the Sprints

The operator's basic goal in the sprints is to make (and SWLs to hear and log) as many contacts as possible, without duplication, during an hour of operation on a single band. Any contact with a VK, ZL or P2 station on 80m during the contest period can be counted, but a station may be claimed only once.

Eligibility

The Australasian Sprints are open to all licensed amateurs, or groups of amateurs using a single callsign, eg club stations, anywhere in the VK, ZL and P2 call areas.

Contest Period

1200 to 1300 UTC, 6 July 1991 (CW only)
1200 to 1300 UTC, 13 July 1991 (phone only, any legal mode).

Frequencies

For the CW sprint, frequencies between 3.500 and 3.700MHz may be used.

For the phone sprint, frequencies between 3.535 and 3.700MHz may be used.

Contest Call

CQ sprint or CQ test or CQ contest.

Exchanges

Minimum exchange for a valid contact will consist of a signal report and a three-digit serial number. The serial number may start at any number between 001 and 999, but will revert to 001 if 999 has been reached.

Logs

Contest logs must show for each contact the time (UTC), callsign of station worked (both callsigns for SWLs), report/serial number given and report/serial number received. Each log must be accompanied by a cover sheet showing the name and date of the sprint (CW or phone). The total number of contacts claimed, and a statement that the operator(s) has abided by the rules and spirit of the contest. This cover sheet is to be signed by the operator(s) and personal callsigns added where multi-operators enter using a club callsign. Any special conditions such as QRP or mobile operation should be mentioned in the statement. Any comments you wish to make will be welcomed by the sponsors.

Logs are to be in the hands of the AHARS, PO Box 401, Blackwood, SA 5051, attention Contest Manager, no later than Friday, 16 August, and the envelope is to be endorsed SW, Phone or SWL Sprint.

Awards

Certificates will be awarded to the highest

score in each VK, ZL and P2 call areas for both the CW and phone sprints. Trophies will be awarded to the outright winners of both. A certificate will also be awarded to the highest scoring novice class operator in the CW sprint only, provided that this entrant is not entitled to another award for the CW sprint. Certificates may be awarded to other operators whose performance was, in the opinion of the sponsors, exemplary.

SWLs

Certificates will be awarded to the highest scoring listener log in the VK, ZL and P2 call areas for both the CW and phone sprints.

Any entry which is clearly in violation of the rules or spirit of this contest, or which contains an excessive number of claimed duplicate contacts (this does not refer to duplicates which have been indicated as such and are not claimed) may be disqualified. The decision of the Adelaide Hills Amateur Radio Society Inc in respect of the interpretation of these rules, the granting of awards and disqualification will be final.

These contests are recommended as a good Saturday evening entertainment. If you have never entered a contest before, here is a good, friendly time to start. Join in and enjoy the fun.

David Box VK5OV

Contest Manager, Adelaide Hills ARS

VK Novice Contest 1991 Rules

Contest Period

From 0800 UTC 22 June 1991 until 0800 UTC 23 June 1991

Objects of the Contest

To encourage participation of amateur radio stations in Australia, New Zealand and Papua New Guinea, with special emphasis on contacts with novice and radio club stations.

Stations Eligible

Only stations in VK, ZL and P2 call areas may enter. No stations outside these call areas are permitted to be worked or entered in a log for the purpose of this contest. Except for club stations, no multi-operator working is allowed. Stations in the same call area may contact each other as well as stations in other call areas.

Contest Bands

All operations must be confined to within the novice frequency sub-band allocations in the 10, 15 and 80m bands. No cross-band operation is permitted. Novice allocation VK HF: 3.525-3.625MHz, 21.125-21.200MHz and 28.100-28.600MHz.

Modes of Operation

Only phone or CW may be used. In the CW mode, operation must not exceed 15 words per minute.

Contest Sections

- Section (a) phone — novice/full call
- Section (b) CW — novice/full call
- Section (c) SWL

Scoring

- For contacts with a novice station — five (5) points
 - For contact with a club station — ten (10) points
 - For contact with a full call station — two (2) points
- ### Listener Section
- For novice to novice contacts — five (5) points
 - For novice to full call stations — two (2) points
 - For full call to full call stations — two (2) points
 - For any contact with a radio club — ten (10) points

A listener (SWL) entry may log only ten (10) sequential contacts made by a station, and then must log no less than another five (5) stations before logging that station again. The five (5) stations so logged need a minimum of one contact only logged.

For phone stations, call CQ Novice Contest.

For CW stations, call CQ N.

Contacts

Any station may be contacted TWICE per band, provided a period of at least 12 hours has passed after the first contact.

Number Exchange

Section (a), on phone. Stations must exchange a serial number comprising an RS report followed by three figures. The figures must commence at 001 for the first contact and increase by "one" for each further contact.

Section (b), for CW stations. As for phone, but the report is an RST followed by the serial number.

Log Entries

Each log should be laid out so as to provide columns in the order given as follows:

Date/time UTC. Band. Mode. Station contacted. Report and serial number sent. Report and serial number received. Claimed score. Each log sheet must be endorsed at the top "VK Novice Contest 1991".

Total claimed score for each page must be shown on the bottom of the page.

Front Sheet

A front sheet must be attached to the contest log and must carry the following information:

Name and address of operator. Callsign. Station location. Section entered. Score. Declaration. The front sheet must also carry a declaration which states — I hereby certify that I have operated within the terms of my licence, and the rules and spirit of the contest. This declaration must be followed by the signature of the operator, with date. In the case of a club station, the entry must be signed by a responsible officer of the club committee, or a licensed operator delegated by the committee to do so. In the case of multi-operator stations, the callsigns of participating operators must also be shown on the front sheet.

Regulations

All stations participating in the contest must be operated within the terms of the station license and applicable regulations.

Entries To

Entries must be posted so as to reach the Contest Manager no later than 26 July 1991. The address for entries is: Novice Contests Manager, WARC, Box 1, Teralpa 2284.

Certificates

Certificates will be awarded to the top scoring stations in each section at the discretion of the Federal Contest Manager.

Certificates will also be awarded to the top scoring novice station in each call area and to

any other entrant where meritorious operation has been carried out in the opinion of the Contest Manager.

Trophies

The Keith Howard VK2AKX Trophy for the novice entrant with the highest aggregate (phone and CW) score, and the Clive Burns Memorial Trophy for the novice entrant with the highest CW score, are perpetual trophies on permanent display at the Executive Office. In each case, the annual winner will receive a suitably inscribed wall plaque as permanent recognition.

Provision is made for adjudication in the case of a tie.

Operator

A person may submit only one contest log per mode.

Logs for entries where an operator uses more than one call sign whilst operating in this contest will not be accepted.

Disqualification

The contest disqualification criteria as published annually in *Amateur Radio* will apply. Any station observed during the contest as constantly departing from the generally accepted code of operating ethics may also be disqualified.

Ken Miller VK2GKM

Novice Contest Co-ordinator

VHF/UHF AN EXPANDING WORLD

ERIC JAMIESON VK5LP
PO Box 169, MENINGIE 5264

All times are UTC

Six Metre Beacons

Due to a shortage of space this month the beacon list has been held over. Please refer to the December 1990 list which has not changed.

V73AT from the Marshall Islands has changed the frequency of his beacon/keyer from 50.090 to 50.035 due to interference — and has been heard by VK4ZJB on the new frequency.

John VK3ZJC, Chairman of FTAC, has asked me to solicit comments through these columns regarding further beacons on 50MHz. At present there are two, one each in VK6 and VK8.

John said that time-sharing is not presently possible due to the appropriate hardware not being available. Options are to have eastern states beacons on the same frequency as the other two or place them 1kHz either side of those two frequencies. Are there other options?

When I raised the matter some time ago, in some quarters there was a very cool reception to ANY further beacons on 50MHz due to possible cross-modulation and other interference problems. It was suggested Channel 0 in Toowoomba was enough beacon for anyone in the eastern states!

Any submissions should go to John Martin VK3ZJC, 3 Vernal Ave, Mitcham, Victoria 3132, or the Federal Office, PO Box 300, South Caulfield, Victoria 3162. A copy to me would be appreciated, please.

Six Metres

Did six metres die? Following the many exotic contacts from VK to other world countries last year, amateurs were heard to say that the band had given of its best for Cycle 22! Perhaps the "best" may be behind us, but there were still plenty of contacts to be made and

many to new countries. We had the exciting openings to Europe during February and March, and since then the band certainly has not been dead.

During April the band opened to W on a number of occasions. On 17/4 around 2240 W6BJJ was worked in VK2, 3 and 7. The openings extended to VK5 with good signals on 20/4 when W5s were worked between 2205 and 2400 by VK5NC, VK5DK, VK5EE, VK5RO, VK5NY, plus VK3OT and VK3LKL, to mention a few. On 20/4 at 0640 Steve VK3OT worked ZS6AXT at 539, then at 0715 VK5NC, followed by VK5NY and VK3AMZ and possibly others, worked ZS4S. The next morning VK7IK worked W5s and was reported as having heard/worked PY5CC at 2350. VK3OT tried hard with PY5CC, but is not certain of the contact. However, at 2345 he was almost certain of a contact with LU7DZ via "side scatter" at 35 degrees, which was a very good effort. Steve also worked quite a number of W5s plus XE1GE and XE1DD and heard XE1IK and XE1KFM. Col VK5RO and Roger VK5NY worked XE1GE twice. Col also worked W5GVE at 2304, K5JUBI and 2330 and 3D2ER at 2345. During these two days, V51E from Namibia was being heard in VK2, 3, 4 and 5 areas, but so far no definite reports of being worked. Lots of VK CW being heard on backscatter throughout the day. 21/4: After the morning (UTC) openings the day was relatively quiet. A few JAs plus KH3AE to the east coast and later at 0940 to VK3OT. At 1100 a big strong signal opening to JA via evening-type TEP. At 2355 VK5RO and VK5NY heard PY5CC. On 22/4 VK8GF S9 at 0945 said he worked ZLs, A35, V73 and HL5 on 21/4.

Refer to South Africa for 27/4. 28/4: From early morning VK5RO, VK5NY, VK5ZDR, VK5LP, VK5NC, VK5DK, and probably others, were involved in working some of the following: P29, V73, FK8, ZL, 2R, W5, DU3,

AH0, XE and JA. Steve VK3OT was able to add 3D2, V63 and F05 to the above list. In fact, from 32 W contacts, Steve worked 10 US states that morning between 0110 and 0324! Some W stations were S9 in VK5. 29/4: 0012 3D2PO 5x9 said he had worked XE1GE plus more than 70 VK stations during the morning in VK2, 3, 4, 5 and 7 areas. 0038 KG6DX 5x5 with heavy flutter; 0118 V73AT 519, 0130 masses of JAs at 5x9 and still there three hours later; 0404 AH6LE 5x7; 2229 YJ8GP 5x9 2320 VK3AMZ reported having worked ZP6BW in Paraguay on 50.133. Many ZLs on backscatter. So the band had died, eh?

South Africa etc

After a wait of many years, South African stations were worked over widespread areas of Australia. The activity started on 19/4 when JAs were heard calling South Africa around 0700. At 0705 Col VK5RO worked ZS6XL at 559 CW and again at 0712 on SSB. (Col said it was 10 years and within 10 minutes to the day since he last worked ZS6 crossband during Cycle 21). Roger VK5NY from 0725 worked ZS6AXT, ZS6XL, ZS6WB and ZS4S. VK5LP heard all four ZS stations, but they were very weak. At 0748 ZS6WB peaked at 5x5 for 15 seconds, and although I called him I cannot be sure of an answer due to heavy QRM from JAs. According to John VK4ZJB some or all of the four ZS stations were worked by VK4s APG, KJL, PU, ZAA, ZAZ, KHZ, BJE, ASO and ZNC. VK4BRG, VK3OT, ZD2BBR and other VK2s and VK3s were there, plus a VK1. The ZS stations were still audible very weakly around 0840 when KH6IAA and KH6JJK were worked at 5x7 with the beam on South Africa. VK5RO worked KH6IAA and 3D2AG. Hugh VK5BC was away fishing and later told on 40 metres what he had missed!

27/4: 0615 VK6RO, VK6HK and VK6JJ worked 7Q7JA in Malawi — signals 529. 7Q7JA heard by VK5RO and VK5LP. At 0623 ZS6s into Perth again for the third successive day. At 0717 the Namibia beacon V51E heard in Perth. 0746 VK6RO reported A22BW from Botswana. At 2330 VK4ZJB, VK4ASO and VK4APG worked AH6JJA/AHO.

Sarina — North Queensland

Ron VK4BRG has again written an interesting letter with details of his Standings List and more exotic contacts, mostly for March. (* indicates new country) — 27/2: 0929 OZ8RW* Denmark, 0931 DL8HCZ, 0935 DL2PK, 0936 PA0HP, 0937 PA2VJS, 0944 DK6/L, 0945 PA0LSB, 0946 DJ4AX, 0947 ON4P5* Belgium, 0952 DK5UG, 0954 DL9GS, 1038 AH6Q/MM in PL49.

1/3: 0057 6W1QC, 0652 NI6E/KH6, KH6HME. 2/3: 2240 NL7OW followed by AL7C, AL7FH, KL7CDG, KL7IKV and leading to 2230 K8WKZ, 2337 WW8M, 2240 K0GJX, 2343 KA0KKO EN26, 2345 K8EFS EN72 — 3/3: 0006 KA0LEE (the last six contacts all in Michigan and Minnesota), 0024 AH6Q/MM RM06, 0025, AH6AP Fairbanks, Alaska. 4/3: 2319 K0GUV, 2331, KA7VLE/O, 2355 K0GUV, 2356 KA0KIF, all EN26 Minnesota. 5/3: 0001 VE5UF* DO61, VE6JW DO33, 0946 NH6YG/KH3, 1022 NI6E/KH6, 1133 V73AT. 6/3: 2348 FO5DR, 7/3: 0801 KH6JEB, 0827 NI6E, 1018 KH6HH, 2337 6W1QC. 9/3: 2134 K6STI, 2154 NL7OW BP41, 2206 V73AT, 2223 ZLs. 10/3: 0056 TI2HL, 0820 NI6E, 2357 KL7Y R091 in extreme west of Alaska. 11/3: 0659 KH6s. 13/3: 0701 NI6E. 14/3: 0656 KH6s. 15/3: 0043 6W1QC, 0755 NI6E, 1148 V73AT.

16/3: 2132 NL7OW, 2315 KL7NO. 17/3: 2317 6W1QC. 19/3: 0237 6W1QC, 0741 NI6E and again at 0919. 20/3: 2200 K6STI. 21/3: 0828 KH6s. 22/3: 0824 KH6s. 23/3: 0724 KH6IAA, 1148 JH1HAO/JD1* Minami Torishima. 25/3: 0700 KH6IAA, 2127 to 2202 nine W6s, one W7 Arizona, 2356 KG6UH/DU1*. 26/3: 0045 TI2KD, 0101 K6STI, 0112 N6CW, 0117 TI2NA, 0129 TI2HL, 2143 TI2HL, 2157 A35EM* Tonga, 2257 PJ9JT, 2306 HH7PV, 2340 FM5WD* Martinique, 2352 TI2HL. 27/3: 0044 NI6E/KH6, 0101 TI2NA, 0150 KH6NS, 0203 FO5DR, 0551 KH6s, 2056 to 2233 20 W6s and W7s, 2251 A35EM, 2311 KP4BZ* Puerto Rico, 2315 KP4EOR, 2340 K6GMV. 28/3: 0017 to 0039 two W6s and two W7s, 0129 NP4NP, Puerto Rico, 0131 TI2HL, 0139 KP4EOR, 0218 TI2HL and TI2NA, 0653 NI6E/KH6, 0714 KH4AE* Midway, 2112 two W6s and one W7, 2127 ZL0AA*, 2129 TI2NA, 2206 YV5ZZ, 2209 YV4AB, 2323 four W6s, 2337 FO5NK, 2346 K6QXY. 29/3: 0631 KH6s, 2226 N6XQ, 2327 P29PL, 2354 K6BSL/CE3 CW scatter via KH6 area.

Ron said there have been constant openings to Japan and these have not been included. He reports VK9YJ on Cocos Island has been "having a ball" and on 30/3 3D2PO worked ZS6, 9Q5 and 5H1 during the morning.

Ron concludes that six metres seems to be producing more and more contacts, but believes it will have to end before long. But, what a mouth-watering list Ron has produced — oh, to be living in North Queensland!

Brisbane

John VK4ZJB sends a summary of contacts he and others made in the area stretching from the Sunshine to the Gold Coast, which indicates what has been available in that area from the end of February to mid-April. The best day was 7 April, with many contacts being made using CW. KH4AE was running 2.5 watts to a five-element beam, and plans to lift the output to 175 watts in the near future. No dates or times are given as it is an overall summary only. 27/2: OH2TI, OH2BC, OH2HK, HL9XB, DL8HCZ, DK2PR, PA0HIP, DJ4AX. March: KH4AE, AH6A/KL7, NL7OW, AL7C, KL7Y, FO5DR, V73AT, KG6DX, HL5BRQ, HL2IPL, JH1AMO/JD1, 6W1QC, HL9KB, NH6/L, K6STI, K6QXY, N6CW, AA6TT, W6SJR, A35EM, FM5WD, KP2A, PJ9JT, KH6NS, W6UXN, AA6TT, WA7BPN, WB6BMS, WA7JTC, K6FV, N7AVZ.

To mid-April: KL7NO, K6QXY, ZL3AA, HH7PV, FO5NK, TJ2BR, YSIECB, PJ9EE, KG6UH/DU1, FO3BM, FO5LK, K6IVY, FM5WD, YV4DDK, KG6DX, ZLTTPY, KH4AE, VK9YQS, WA6BYA, K6PXT, N6AJ, W6PO, PJ9JT, YV5ZZ, A35EM, KP4EOR, NP4NP TI2HL, KP2A, V63AO, YV4AB, W6WYN, WA7CJO, WA7JTM, W5OZI, S9+04B, W7RV, W5VY, W6XD, W7BONF, KFTNP, WA7RM, WB4OSN, K1RJMA, W7GZ, N7SJM, K6OJS, WA7FPO, K6STI, K6BVF, AA7A, AH3HA, KH6HH, WA6LHD, FO3BM, HL5BRQ, HL5BRQ, FO5DM, FO5BM, V73AT/ B.50.05B. On 28/4: ZK1CG, XE1EG. 29/4: W6, FO5, V73, V63, KH0, KG6, JA, P29, ZL, HL, KH6.

The contacts John made during the above period gave him his Worked All Continents and a score of 78 countries worked on six metres.

Tasmania

A letter from Maurice VK7SA provides information on 6m activities in southern Tasmania. 13/1: VK7SA and VK7IK at 2355 worked WB5FCR followed by K5UR.

9/3: Same stations at 2340 worked KL7Y. VK7IK worked as follows: 26/3: 2252 A35EM; 29/3: 0100 K6BSI; 30/3: 1045 V73AT, 1137 VK9YX. Also on 29/3 a good opening at 0200 to JA with activity from VK7s, ZIF, SA, IK and JWR.

5/4 provided one of the best openings to the west USA coast with K6QXY and WA6BYA being worked at 0050 by VK7s, IK, SA, KWR, AZ and ZBA. Signals were up to 5K7S. VK7SA worked 8J8WUS at 2340 on 9/3 and queried where the station was located. This would be one of the new prefixes allotted to Japanese stations, as is 7LI reported by VK3OT.

Frank VK7ZMF in the central highlands has also been active on six metres.

Cocos Island

From 27 March to 2 April Peter VK9YJ operated from Cocos Keeling Island using a

nine-element antenna (courtesy VK3OT) and a TS575. In 48 hours he worked 16 countries to provide him with Worked All Continents on six metres. In all he had 450 contacts on the band and the log included KP2A, 9H1GB, IT9LCY, FM5WD, TQ7JA, YV5ZZ, KH6UH/DU1, HC2BI, NI6C/KH6, V6SMQ, V73AT, WA6EMV, NH6YG/KH3, 457AVR, ZC4MK, PJ9EE. Many JAs were worked. Peter worked easterly to South America and westerly to Africa, thus "circumnavigating" the world! Info from VK3OT and the Geelong Amateur Radio Club newsletter.

National UHF Field Day

This event was won by the Geelong Amateur Radio Club VHF team from Mount Cowley with a score of 6436 points. According to their newsletter, overall support from other teams for the event was poor, and there is a danger that the event may be modified or even cancelled.

Rockhampton

Lyn VK4ALM has sent in his Standings List and added that March/April in the Rockhampton area has produced contacts with KH4, AL7, 6W1, FO5, V73, JE etc, K6, TI, PJ9, HH7, KP4, YV4, FM5, KG6, KG6/DU1. After almost 30 years, these contacts have allowed him to obtain WAC on six metres. Lyn was very impressed that it became possible to work Europe — an event many thought impossible not so long ago. Lyn's present lament is that so far he has not been able to work 3D2! (I know the feeling — I have not been able to work 5W1 ... VK5LP).

Six Metres Standings List

So far there has been a relatively slow response to my request for confirmed information for inclusion on the present list. Graham VK6RO was the first to respond and, amongst others, I have received an extremely well presented entry from Lyn VK4ALM. In his case, he has opted to have two licensed WIA members verify his confirmations.

For the next listing in August, all present and any new entries will be shown in the form used in the past. For the February 1992 listing those who have verified their entry will be designated in a way yet to be decided.

Germany

Steve VK3OT reports that 600 amateurs in Germany have been given temporary permits to work six metres while the authorities try to resolve what is required for the future.

Cairns

By the time you read this, Channel 0 television should be off the air in the Cairns area, after concluding its period of co-channel operation with UHF. This will free that area for 6m operation.

(On the subject of Channel 0 it is disap-

pointing to learn that, contrary to departmental policy, the commercial Ch 0 in Tamworth will continue to operate on VHF instead of going to UHF has the ABC).

Japan on Two Metres

On 13/4 and 14/4 JA6s were worked by Jeff VK8GF and others in Alice Springs between 1045-1105 and 1040-1105 respectively. Signals were up to S9 with SSB on 144.100 and FM on 145.000, but readability was a problem. Mike Hastings VK4BFO, in Mount Isa, wrote to say that on 15/4 he worked JI7DMB at 1040 on 144.100, sending 539 and receiving 559. Mike runs 100 watts to a 13-element horizontal yagi. He said the distance was 6740.3km and 134km further than the previous record. Whether it is further from JA6 to Alice Springs than JI7 to Mount Isa no doubt will be determined in due course, and therefore indicate who holds the record.

Melbourne

Ron VK3AFW has written regarding Melbourne activities on bands higher than six metres.

Aircraft enhancement contacts have been made with VK1BG on 2m and 70cm on Sunday mornings and tropo 2m CW to VK7ZHA during weekday mornings. On 30/3 Ron worked VK1AU on 144.200 via aircraft enhancement for the first time.

Following a large sun flare on Saturday 22/3 the solar noise made contacts to VK1BG difficult, and auroral reflections were observed between VK3AFW and VK7ZHA. The noise was still evident on the Tuesday morning skeds between VK3AFW and VK7ZHA. Charlie VK3BRZ called with a signal difficult to recognise. It was found signals peaked towards the magnetic pole, unlike evening auroral signals which usually cover a broader spectrum. The Mount Gambier beacon was stronger via the auroral path than direct at

2225 Roger VK3XRS was contacted with both beams pointing south, as did Arie VK3AMZ. The enhanced conditions were fading by 2300.

Ron VK3AFW makes the comment that it was unfortunate there were no VK5s or ZLs around. The path length into southern ZL is not much greater than into East Gippsland from his Oakleigh location when propagated by an aurora. VK1, 2, 6 and 8 might have been possible, as the visual aurora was seen as far north as the Blue Mountains.

On 3/4 at 2223 a successful contact with VK7ZHA on 2m led to an attempt on 70cm, but signals were too weak for a two-way contact. At 2239 Roger VK5NY worked Des VK3CY at 5x5, but no two-way to VK3AFW. At 1058 on 4/4 VK3AFW worked Trevor VK5NC at 5x4. At 2230 a 519 contact was made to VK5NY. On 6/4 VK3AFW worked Ian VK1BG at 5x3 on 2m and 5x1 on 70cm, Gordon VK2ZAB on 2m at 5x4, and for the first time, Eddie VK1VP at 5x1 on 70cm. Later, Ian VK3AQU and Roger VK3XRS were worked.

The Home Scene

During April David VK5KK, Keith VK5AKM and Mark VK5AVQ spent a day working on my antenna system which had been damaged in a severe hailstorm, thus getting me back on 50, 144, 432 and 1296MHz. (The golfball-sized hailstones fell so heavily that they took chunks out of the edges of my concrete driveway and smashed more than 100 tiles on a neighbour's roof — I'm not kidding!). Over one of many cups of coffee, discussions centred on making use of my good location with VK5LP becoming operational on 2304MHz. I'll need more shack space soon!

For those who may wonder when do I operate on these higher frequency bands, as I am not often heard, the answer is simply that I am still in a recovery situation, and some nights I am in bed soon after 7.30pm, but as I improve there will be more activity!

Closure

April was a busy month for many 6m operators, but exciting for the number of new countries worked. No doubt there will be some tapering off in contacts until the next equinox.

Closing with two thoughts for the month: "Most people quit smoking in two stages — first they give up their cigarettes, then they give up yours", and "One advantage of modern art is that you can answer the questions the children ask about the nudes".

73 from The Voice by the Lake

Late Items

22/4: Col VK5RO and Roger VK5NY attempted a contact with PY5CC at 2355, but QRM on the frequency prevented a two-way contact. PY5CC was first heard at 2245. 26/4: Apparently a good opening from ZS6 into VK6 — no details so far. V51E also worked in VK6 around 0800. 30/4: 2239 3D2AG 5x9. 1/5: 0050 KG6DX 529 with flutter; 0102 KG6UDU1 5x3 to VK5NY, VK5RO, VK5NC and VK5LP to give me a new country. 5/5: Between 0245 and 0300 VK3AMZ and VK3OT worked W7s on what seemed a dead band.

Every now and again six metres turns up something special. Such an occasion was on 8/5 when, in response to a telephone call from Steve VK3OT, I was able to work Bill Tynan WX0X/5 at 0029 with signals 5x3 both ways. Bill and I had been hoping for such a contact for many years, and at last it eventuated. Bill writes the "World above 50MHz" notes for QST and we have been swapping information for years. The band was open to VK5 from that small portion of Texas for less than 10 minutes, and I also worked W5OZL; one other W5 escaped me. Who said the band had died! Bill was also worked by VK3OT, VK3LK and possibly others.

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HOW'S DX

STEPHEN PALL VK2PS
PO BOX 93, DURAL 2158

As I write these lines, news is to hand that the latest cyclones claimed hundreds of thousands of lives in Bangladesh.

Damage runs into hundreds of millions of dollars, and television programs show graphic pictures of the devastation. Communication lines are interrupted. Normal life came to a standstill. Human misery, despair everywhere.

In other countries of the world, when nature lashes out and shows its power, the radio amateur service springs immediately into action to serve in re-establishing communication lines. The Mexican and Armenian earthquakes, Hurricane Hugo and, not long ago, the

Newcastle earthquake in our own country, were events where the radio amateur spirit of research, experimentation, practical application of knowledge and desire to help greatly assisted the authorities in their emergency relief work.

What a pity that successive governments, for the past 10 years, banned amateur radio in Bangladesh!

South Pacific and VK2GJH

Jack Haden VK2GJH (QSL with appropriate reply envelope and return postage to: PO Box 299, Ryde, NSW, Australia 2112) is on a

two-months Pacific tour. He was active from the club station of C21NI in Nauru until May. Most of his time will be spent at his home in Tarawa, Western Kiribati, and he will use his local call sign of T30JH. Time permitting, he might go to Banaba Island and operate as T33JH. Jack checks into various nets quite regularly — 14222kHz at 0530 UTC and 14227kHz at 1100 UTC. During the day he can be found around (28520kHz, and in the evenings he often appears on the Pacific Islands Net on 14315kHz at 0800 UTC.

Bangladesh — S21U

For events leading up to this DX activity, please refer back to the May issue of AR. Jim VK9NS, despite the difficulties and restrictions imposed on him by the Bangladeshi authorities, managed to have approximately 600 contacts, all on SSB, and mostly on the

14MHz band. It was a frustrating time for Jim, with only about 2 1/2 days' operation in 30°C conditions. The religious festival of Ramadan was still in progress, and office and other official activity ceased at 3pm local time. After receiving his operational licence on Tuesday afternoon, it took him almost the whole of Wednesday to have his equipment released from bond. He could not use the beam antenna left there a year ago by the Japanese operators.

All Jim found was a pile of aluminium tubing, with nuts and bolts missing here and there. Contrary to previous reports that he used a vertical antenna, he used a multiband dipole and a TS440S, and all the time he was monitored by his "assigned" assistants. QSLs to be sent to JA1UT. Should you be unsuccessful getting your card from JA, you might re-QSL directly to Jim as from mid-June. Send reply envelope and return postage cost (Norfolk has its own stamps) to J Smith, PO Box 90, Norfolk Island 2899.

Bhutan — A51

Bhutan was supposed to be on the bands from early May. However, at the time of writing there is no news about the start of operation. And we are well into May, Jim VK9NS and Kirsti VK9NL left for Bhutan on Sunday 28 April. They intended to stay there for two weeks and be active on all bands and all modes, especially on CW. Jim sent ahead an amplifier, beams and RTTY gear. Friends all around the world hope that Jim and Kirsti were not caught up in the aftermath of the devastating cyclones in Bangladesh, where they had to transport for Bhutan. QSL direct to VK9NS.

United Kingdom — M0

To celebrate the 200th anniversary of the birth of Samuel Morse, affiliated clubs of the RSGB used the very special callsign: M0RSE from 9 April to 30 April 1991. Naturally, they were active in the CW mode. QSL via the RSGB HQ.

Future and Past DX Operations

G4BZP Larry will be in Burundi for eight weeks beginning 6 May, and requested and hopes to get permission to operate and use the callsign 9U5BZP.

F6BFH advised that several French amateurs activated Ushant Island (EU-65), the most extreme western part of France, off the city of Brest. The callsign used was FV6OST. QSL to F9IE.

John K8SLRO/KH9 was active on Wake Island from 16 April for 10 days. QSL to WA2NHA.

Ron ZLIAMO was active in the second part of April from Wallis Island as F00BW. He was later joined by Katsu FW/VK2BEX. QSL direct only to ZLIAMO Ron Wright, 28 Chorley Ave, Massey, Henderson, Auckland NZ 1208. VK2BEX Katsu Asahina, PO Box 195, Killara NSW 2071.



Laci HAOHW is often heard on the longpath in VK with a very strong signal.

SY/DJ6SI Balduz was operating CW only from Mount Athos SV2/A for a few days late in April. QSL direct only with SAE and two IRCs or two green stamps, within six months, to his home call.

Alain F6ACT was operating in April/May from Madagascar as 5R8AL. QSL to F6HUI.

Reports from the Soviet Union indicate, as related by Andy UA3AB, that Romeo, of Spratly and Afghanistan fame, is planning a DXpedition to Myanmar, formerly known as Burma. The rumour is that the legitimate "XZ" prefix will be on the air in June. Let's hope so... Does anybody have an idea of the magnitude of the pile-up which will be created?

The Japanese are getting more active in organising short duration DXpeditions. Not so long ago, they were on VK9X Christmas Island in the Indian Ocean, working almost exclusively JA stations. Another group was active as KC6/JF1VXB from Palau and as KH2/JK1XPX from Guam.

JG1DUN and JF1WQC were in Tahiti from 30 April until 5 May, and KH0JA1HGY operated from the Marianas. FS/JA4RED, FS/JL1RUC and nine others were active from the French St Martin Islands.

The Sovereign Military Order of Malta was booming into VK/ZL on 1 May as 1A0KM. QSL direct to I0J. Antonio Privitera, via Ceresio 34 I-00199, Roma. SAE and two IRCs or two green stamps.

At the time of writing, it was rumoured that Angola D2 will be activated by several Russian operators. Likely callsigns mentioned were: UT3UY, LY2DF, UT4UM, RT5UL and RT5UY.

Joe CE9GEW and Oscar CE2NVH/9 are both operating from South Shetland Islands. QSL to PO Box 74D, Punta Arenas, Chile.

WZ6C, who previously was active from ST4,

arrived in Bangladesh on a work contract lasting several years. He is hoping to get permission to operate.

Don WB2NDN operated as A61AD mid-May, and concentrated on the WARC, and 40, 80 and 160m bands. QSL to his home call.

Bering Island — 55°00'N and 165°15'E

Vitus Bering, a Danish explorer who served in the Russian Navy, discovered this island in 1741. During his other exploration voyages, he proved that Asia and America are separated by a 80km wide strait — later named after him. To celebrate the 250th anniversary of the discovery, there will be a Soviet-Danish DXpedition to this island from 27 July to 16 August, with about 12 to 15 amateurs from Russia, Denmark and other countries. A commemorative award will be issued. Operators known at this stage are: UA3DLT, UA3DPX, UA3DNV, RA3AUU, G0GWA and G0KPH.

Iota Islands and Bernhard — DL2GAC

A great supporter of the IOTA program (Islands on the Air), Bernhard spent six weeks in India and four weeks in the Solomon Islands group as H44MS, where he was active from Rennell Island (OC-127), Reef Island (OC-65) and New Georgia Island group. Later he will go to Nauru, Philippines, East Malaysia and Borneo and he hopes to be back in Germany by the end of May. Last year, on a more extensive trip, he made approximately 250 QSOs and finished QSLing those QSOs by the end of December. QSL direct to his home call DL2GAC or via the DL Bureau. Incidentally,

the IOTA frequencies are as follows: 14260, 21260 and 28460kHz.

St Peter and Paul Rocks — PY0

Finally, after months of preparation, the "Natal DX Group" was able to land its expeditioners on this inhospitable rock formation east of Brazil in the Atlantic Ocean (0°-9'N and 29°-3'W). On 5 May we heard that at 0030 UTC the group was 15 miles offshore. By 6 May the operation was in full swing. The signals came over the North Pole and were 55 in Sydney. Quite a number of VKs were the lucky ones to work them. The group hopes to stay there 10 days, be active on all bands on SSB and CW, and expects to make 20,000 contacts. QSL with donations (See Feb '91 AR/ to PS7KM Karl Mesquita Leite, Box 385, 59001, Natal, RN, Brazil, or to the "Natal DX Group", PO Box 597, 59021, Natal, RN Brazil.

Special Event Stations

Quite a number of special event stations operated in May.

EH5TCD was celebrating the 100th birthday anniversary of the Spanish tenor Cortis.

VI9IAG was celebrating 200 years of Morse signalling (in the "SSB mode") from the old telegraph station near Alice Springs, NT. QSL to the VK1 QSL Bureau.

VI3AHY celebrated 100 years of local government in the Yarrowonga shire. QSL via the VK3 QSL Bureau.

4JOQ was operated from Zone 19, Eastern Siberia. QSL to Box 50, Riga 226010, Latvia, USSR.

VK5KL was active from 17 to 20 May, during the Kernewek Lowender (Cornish Festival) held in the South Australian towns of Kadina, Wallaroo and Moonta.

4U6ITU was active from Geneva on 2 and 3 May operated by Paul IIRBJ and his father IIRB.

8N6ARL was active during May from Okinawa, celebrating the JRRL annual meeting which was held this year on that island.

TP5OK. The Council of Europe Radio Amateur Club celebrated the admission of the new member state Czechoslovakia into the European Council.

VI75CUB celebrates 75 years Cub Scouting activity in NSW. QSL to the VK2 Bureau.

Interesting QSOs and QSL Information

Note: Callsign, Name, Frequency, Mode, UTC, month of QSO.

9L/DJRL-Theo-14012-CW-0910. QSL to Theo See, Breulgassee 13, D, 6457, Maintal 2, Germany.

H44VU-Heiko-14003-CW-0500. QSL to DL4YU Heiko Halfmann, Kolpingstr 14, D-4358, Haltern, Germany.

3D2QC-21004-CW-0100. QSL to SM3CER, Jan Eric Rehn, Li sataet, 18. S-86300. Sundsbruk, Sweden.

YS1DRF-Richard-14001-CW-0300. QSL to W2PD Saul Slonim, 320 Rose St, Massapequa, NY, USA 11762.

TF3DX-Villi-21004-CW-1126. QSL to Box 1058, Reykjavik, Iceland or via the Bureau. VP5VTD-Rick-21038-CW-2101-Mar. QSL to Bureau or to W4OVU Bruce P Phegley, 3940 N. 4th Court, Coconut Creek, FL 33066 USA.

FM5BH-Laurent-21009-CW-1110-March. QSL to F8HEQ Jean C Blot, Rue Du Dr Roux, F 78390, Bois D'Arcy, France.

FP/KH21-Takuro-14222-SSB-0637-March. QSL to JK1KRS Takuro Tsuda, Box 27, Narita, Chiba, 286-91 Japan.

9M8ST-Siong-14196-SSB-1052-March. QSL via Bureau or 171D, Cookies Drive, 93150 Kuching, Sarawak, Malaysia.

V85FC-Chang-14006-CW-1250-March. QSL to PO Box 1311, RSB 1913, Brunei.

KB6QE/KH0-Hugh-14227-SSB-1226-April. QSL to Hugh Franklin, PO Box 209, Saipan, 96950 USA.

V85EB-Brian-21205-SSB-0528-April. QSL to GOAWF: RSG Snow, 21 Wheatfields, Whatfield, Ipswich, Suffolk, IP7 6RB UK.

CN8NS-Said-1422-SSB-0622-April. QSL to PO Box 6577, Rabat, Morocco, Africa.

9X5SW-Wolf-21205-SSB-0538-April. QSL to c/- Deutsche Welle, PO Box 420, Kigali, Rwanda, Africa.

HI3ADJ-Genoveva-14222-SSB-0601-April. QSL to Genoveva De Bonillo, Box 3, Santiago De Los Caballeros, Dominican Republic.

TU2XZ-Kuma-14222-SSB-0649-April. QSL to BP 3862, 01-Abidjan, Ivory Coast, Africa.

RTTY News

Syd VK2SG is back in his familiar surroundings and is providing, as always, an interesting cross-section of RTTY activity.

* 5T5/DK2XN-14083-0745Z. QSL to DK2WV.

* J6LOE-21086-2156Z. QSL to Box 307, Vieux Point, St Lucia, West Indies.

* 4K2FJL-14079-1006Z. QSL to W6MKB.

* Y570B-21089-1350Z. QSL to callbook address.

* VP8AUW-28084-1256Z. QSL to 1991 callbook address.

* TJ1MR-14089-2318Z. QSL to F6FNU.

* 4LDXC-14085-0632Z. QSL to UT5HP, Box 1, Schastie, 348903, USSR.

* YN1CB-14084-0322Z. QSL to PO Box 3733, Managua, Nicaragua.

* 9Y4DG-14084-0443Z. QSL to WA2NHA.

* 9Q5BG-28085-1600Z. QSL to F5JT.

* EA9TL-21092-2039Z. QSL to PO Box 91, melilla, North Africa via Spain.

From Here and There and Everywhere

Jarmo OH2BN as QSL manager for the 1990 Jarvis Island Expedition, reports that all direct QSLs for AH3C/KH5J have been processed, and Bureau cards are being done now. He says further that he no longer will be

involved with amateur radio, and all those needing Jarvis cards are advised to write to Martti Lane OH2BH, to Nuottaniementie 10-D-20, 02230, Espoo, Finland.

Hartmut 9X5HG has not been active lately. He was on holiday in Germany.

FT4WC on Crozet Island can be heard on 14160 at 1900 and 2100 UTC in list operations, and on 28510 around 1500 UTC and on 21270kHz at 1530 UTC. You have to be a night-owl in VK to work the station.

If you heard YQ3R, it was a special event station from Romania. QSL to YO3CD.

During a QSO with CU2AT, he said that in the past the Azores amateurs had some problems with the central QSL bureau in Portugal. As a result, the Azores now has its own QSL Bureau, PO Box 211, St Miguel's Island, 9502, Portugal.

Alain F6BFH, QSL manager for various French stations, is a telephone card collector and he prefers phone cards (used) instead of IRCs or green stamps as payment for return postage.

"The Traveller's Net" is a contact point for all those who travel on land in VK and in Australian waters. The net is active every day at 0300 UTC on 14116kHz. The net controller and his assistants are: Roy VK6BO, Peter VK6HH, Bob VK5RI, John VK4MX, Andy VK3CAP, Alex VK3BMS, Edgar VK2EDM and Roy VK2IV. For novices, there is a similar net under the banner "See Australia First" on 21185kHz at 2300 UTC and/or at 0400 UTC. Net controller is Ross VK6DA.

VP2EXX advises that he now has a new QSL manager for all his past and present operations: KC8JE.

A reciprocal operating agreement covering amateur radio operations has been signed between Thailand and the United States.

Carlos CO6CG has a lot of problems with the incoming overseas mail. Please do not send him green stamps as return postage, only IRCs. Please type the address on the envelope; do not show call signs; and, instead of postage stamps (if possible) use a franking machine sticker obtainable from bigger post offices.

The DXCC committee has approved the following operations for the DXCC Countries List: ET2A Ethiopia, S20VT (April 1990) Bangladesh, SV2RE/A Mt Athos, SV2UA/A Mt Athos, SV2ASP/A Mt Athos and SY/DJ6SI Mt Athos. The total of DXCC countries is now 322.

ZS8MI is now QRT, but in six months' time he is expected to begin operations from Gough Island, ZD9.

HR1LW was Yoshi operating from Honduras. QSL to JAILW or via the JA QSL Bureau.

Eric, who last year was active as 3D2EA, advises that he is now in VK2 and it does not appear that this year he will go to 5H3 Tanzania.

CE0ZVS is a new station on Juan Fernandez. QSL to CE3PVS.

FOC call on CW, it did not refer to French Oceania. Rather, it was connected with the activities on the FOC Club (First Class CW Operators' Club), commemorating the 200th anniversary of the birth of Samuel Morse.

Dieter, who in 1989-1990 was very active as TL8WD, has a new call, ZL2QB.

John XQ0X left St Felix Island in April. There is no news of any future activity from that island.

If you worked 3DA0BK, he was Franz Taschl, PO Box 122, Eveni, Swaziland, Africa.

R4CG was a special call in memory of Yuri Gagarin, first man in space. QSL to RA4CC.

Gus 9Q5TE should be active again in June. By that time he will be back in Zaire, after a well-earned holiday back home in Sweden.

Al 9K2CS of Kuwait has attended the Dayton Hamfest at the end of April.

As promised, Bing VK2BCH has reappeared on the bands from Rotuma as 3D2XV. QSL to home call, direct only, with SAE and return postage.

It is my belief that if I receive a QSL card from overseas with an SAE and the corresponding cost of return postage, the sender of the card expects a reasonably quick answer to his request. I usually send back my card within 48 hours. To my surprise, a US amateur, who

wishes to remain nameless, wrote me a letter of thanks for my speedy reply. I quote from his letter: "The contact was on 4 April, and your card was in my hand on 16 April; what a turnaround! The point of my letter is that, maybe as a DX editor of AR, you could influence some of your readers to respond to direct QSLs a little better." He enclosed a list of callsigns, among them well-known DXers, from whom he expects direct cards.

The waiting time, according to this list, is from seven months to just a little over one month. Come on, fellows... everybody understands a bit of a delay, but we can do much better than seven months or four months... What about cleaning up your overdue QSL replies... ?!

QSLs Received

Note: W=week; M=months; Yrs=years; FM=from; Mgr=manager; OP=operator.

Direct cards: TF3DX (4W FM OP); TA2AO (5W FM OP); CN60MA (19W FM OP); V85EB (3W FM OP); VK0KC (4W FM MGR); SV2RE/A (5M FM OP); AA6L/F/KH5 (10D FM OP); 5HOQL (2M FM MGR); 7Q7KG (2M FM MGR); ZS9/W6KG (MM FM MGR); 9U5QL (2M FM MGR); FY5EW (2M FM MGR); 9M8LL (4W FM MGR); 9M8FH (4W FM MGR); 9M8AJ (2M FM MGR); 9X5HG (2M FM OP); T19CF

(9M FM OP); 1A0KM (3W FM MGR); P4OV (4W FM MGR); 9Q5TE (3W FM MGR); BY1QH (8W FM OP); BV2CL (2W FM OP); XW8KPL (2W FM OP).

Thank You

As always, I am very grateful for the help and assistance received from: VK2DID, VK2SG, VK3DD, VK3JFE, VK4AI, VK4DA, VK4OH, VK5QW, VK5TL, VK5WO, VK9NS, CO6CG, DL2GAC, F6BFH, 10IJ, OH2BN, TP2CE, 9X5HG and the QZB DX, The DX Bulletin and DX News Sheet.

Late News

Going to press, news has reached us that Jim and Kirsti are safe and well in Bhutan.

Ken VK5QW spent almost a full day trying to track them down. After many unsuccessful attempts, he was able to get a phone connection to Bhutan and spoke to The Chief Engineer of Wireless Division in Bhutan, Mr Sherab Dorji, who said that Jim VK9NS and Kirsti VK9NL are safe and well in Bhutan. Ken was unable to speak to Jim and Kirsti personally. Mr Dorji said that, for an unexplained reason, Jim and Kirsti were not granted permission to operate. The full story will probably be told when the Smiths return to Norfolk.

Good DX and 73

ar

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POUNDING BRASS

GILBERT GRIFFITH VK3CQ
7 CHURCH ST BRIGHT 3741

After what my log-book tells me is a break of nearly a year, I have managed to spend a little time in the shack actually using Morse code! So this really does seem to be the time to talk about the basics, and about the early learning times on air that all of us go through. So this, Marlene VK3WQ, for that contact, and I noted after the QSO that the last time we spoke was over a year ago when your callsign was VK3FML!

I have received a letter from David VK3DRG, which has some bearing on the subject, and he says:

"I have been licensed since the late '50s, but after about 10 years of being active, I travelled to various parts of the globe and never quite got around to setting up a rig. Am now back for good and getting organised. No rig as yet, but am listening around the bands. I used to have a reasonable fist and I feel that the requirement for Morse should be retained. Fourteen words per minute wasn't all that difficult years ago and I see no reason for change. But my morse is now very rusty so I'm back to listening to the slow morse and building up again. So I'm virtually in the position of the newcomer who tries his fist for the first time.

Listening to people calling on the low end of the bands, one finds that the majority give out with a CQ etc produced by some machine at a rate of knots. Only another very polished operator would go back to them ... or, indeed, be able to read them. Now these operators are the ones who should be making an effort to encourage others to use the key or whatever other devices take their fancy. If we can encourage the newcomers to use morse, we will build up more and more operators who will develop their own faster speeds as time goes by. But we have to let them in and talk with them at their speed. So I suggest that there should be a sort of gentleman's agreement that a general call should be at, say, not more than about 16wpm.

Once contact is established, then by all means speed up to a rate which is comfortable for both parties. It may well be that some of the experts might slow down once in a while and have a contact with a new operator, just to build confidence and give encouragement. Morse is to some extent a dying art, and if we want to preserve it, we have to try to build up the number of operators. How better than by having a contact with the less experienced operator at a speed they can handle, and so build their confidence so they can go on to

being a really competent brass pounder?"
(David VK3DRG)

I am sure we have all had the same experience as beginners, but I also thought that there already was a "gentleman's agreement" covering the same circumstances, and that it was more or less common courtesy to slow down to the other operator's speed. Are you aware of this, and is it true?

I think we can understand that some operators may not want to slow down for some reason or another, but I always thought that it was good manners to reply to a call at whatever speed or if one's patience runs out, cut the QSO short in as polite a manner as possible.

Experienced operators will be familiar with many of the tricks for cutting a QSO short, and maybe it would be a good idea if you all wrote to me with some of your favourites, we could even have a competition.

Some that I am afraid I have used include having to go to dinner, QRN (which quite often is true), and even just falling asleep. One could go so far as to slowly turn down one's transmitter power and say that the band was closing! I know it is sometimes easy to get bored with a conversation, and it would pay all operators, whether beginners or experienced, to at least keep their overs short.

A few years ago there were a group of operators who regularly used full break-in during their rag-chews and nets. I don't know whether they have all disappeared, or whether I just can't find them, but it is worth the effort to master the procedure, especially as most rigs have full break-in (QSK) capability. I guess I am guilty of disappearing as well as not using QSK, and I will try to make a point of asking in future if the person I'm in contact with has QSK capability.

For those who have never used QSK and who might not even know what it is, I will give a brief description.

All will be aware that the code consists of dots and dashes separated by spaces. Suppose you can listen to the frequency you are transmitting on at the same time as you are sending, much as any other listener on the frequency can. You would be able to hear your own signals, and you could also hear if another station transmits at the same time. It is fairly easy to achieve the situation where your receiver listens between every dot and dash that you send. And, many operators use a form of QSK where the key operates the VOX with a

suitable delay so that when one stops transmitting, the rig drops back to receive after a second or two. This is actually called "semi-break-in" and mainly saves one from having to manually turn the rig to transmit.

Technically, full break-in is a little more difficult to comprehend. The time intervals are so short that it is difficult to understand exactly what is happening. Bear with me as I try to explain.

Imagine that a dot has just finished and we are going to listen for a while before the next dot. What needs to happen is, the transmitter having just shut down, we have to turn on the receiver as quickly as possible, and have it come on at a pre-set volume, and at the right frequency. Then, when the next key press comes along, the receiver must be turned off, the frequency changed, and the transmitter turned on for the next dot. I won't go into too much detail with the timing of these actions, but it is critical, and it gave me a lot of headaches when I was building my 80m transceiver (from tx and rx kits).

If you are going to try full break-in for the first time it will pay to experiment with the various settings on your rig. I have no way of telling you how to adjust these settings, but with a bit of help from your instruction manual you shouldn't have any problems. The main thing to do is to have the volume of your side-tone and the volume of received signals about the same, or maybe a little less on your side-tone. You will need to experiment with the AGC settings which should probably be set to "fast" if you have the usual "fast, slow, off" option. It will make you more careful with your frequency setting, because you will find that hearing the same tone on receive and transmit is beneficial, and if you set up to do this, the frequency will be spot-on. Assuming the RIT is OFF, of course. If you are troubled with the noise from the rig as it switches (some click a lot!) try wearing headphones as well. Have I left anything out? Let's hear your views.

It is a lot of fun to work using QSK and can be extremely convenient for both sides of a QSO. Some operators (of whom, you will have guessed, I disapprove) ramble on and on, and one's house could burn down while waiting to reply. It is, therefore, both polite and convenient to be able to send a dot or two to shut him up, so that you can put out the fire without missing anything interesting. Am I being unreasonable? Or just thick, as usual? I guess I'll have to wait and see. If you happen to hear me on air, give a dot or a chirp to see if I'm listening between MY dots next time ... I just had a horrible thought for another knob on the rig, one that would dial in a bit of chirp for flavour!!!

ar

AMSAT

MAURIE HOOPER VK5EA
11 RICHLAND ROAD NEWTON 5074
PACKET: VK5EA@VK5WI

NASA 2-Line Keplerian Elements (Set 124.AMSAT)

DECODE 2-LINE ELSETS WITH THE FOLLOWING KEY:
1 AAAAAA 00 0 0 BBBB.BBBB.BBBB CCCCCC 00000-0 00000-0 0 0002
2 AAAAAA EEE.EEEE FFF.FFFF GGGGGG HHH.HHHH III.IIII JJ.JJJJJJ KKKKKK
KEY: A-CATALOGUE B-EPOCHTIME C-DECAY D-ELEMENTUM E-INCLINATION F-RAN
G-ECCENTRICITY H-ARGUMENT I-MANOM J-MOTION K-ORBITUM L-CHECKSUM

AD-10
1 14129U 83 58 8 91121.60065856 - .00000148 00000-0 99998-4 0 9710
2 14129 25.8131 148.0591 60353555 238.5956 48.7305 2.05930413 31262
00-11
1 14781U 84 21 8 91122.69224067 .00003170 00000-0 57549-3 0 104
2 14781 97.9005 169.0862 0010841 319.1087 40.9236 14.66845596382761
NOAA-8
1 15427U 84123 8 91123.10234242 .00000560 00000-0 32130-3 0 7778
2 15427 99.1703 135.5346 0014089 187.1460 172.9510 14.12985564329151
MIR
1 16609U 88 17 8 91122.53643102 .00041942 00000-0 40528-3 0 4473
2 16609 51.6051 158.9464 0008449 188.6956 193.4219 15.65973346298013
NOAA-10
1 16969U 86 73 8 91120.06912542 .00000949 00000-0 42827-3 0 8262
2 16969 98.5875 146.4917 0014660 70.1439 290.1318 14.24101472239707
RS-10/11
1 18129U 87 54 8 91122.55873330 .00000997 00000-0 99999-4 0 8356
2 18129 82.9239 92.6743 0010665 318.9430 41.0927 13.72181431193336
MET-2/17
1 18520U 88 5 8 91121.85361924 .00000196 00000-0 16501-3 0 5226
2 18520 82.5399 97.1266 0018894 143.9190 216.3113 13.84476200164277
AO-13
1 19210U 88 51 8 91121.30113593 .00000118 00000-0 99998-4 0 2712
2 19210 56.0390 97.0967 7161973 253.2812 22.8340 2.09698033 22040
MET-3/2
1 19336U 88 84 8 91121.83203238 .00000113 00000-0 27562-3 0 7745
2 19336 82.5434 51.9899 0015805 236.0518 123.9108 13.16923357132893
NOAA-11
1 19531U 88 89 8 91122.43824724 .00000628 00000-0 30859-3 0 5270
2 19531 99.0276 76.8911 0012935 106.9187 284.3410 14.12118579134016
MET-2/18
1 19851U 89 18 8 91121.69193723 .00000343 00000-0 29828-3 0 4744
2 19851 82.6268 334.6825 0014014 184.7378 175.3655 14.84130309196626
MET-3/3
1 20026U 89 86 8 91121.72427256 .00000043 00000-0 99999-4 0 3732
2 20026 82.5584 353.3304 0014933 253.1627 106.7957 13.15951988 72848
UO-14
1 20437U 90 5 8 91122.22417975 .00001104 00000-0 45135-3 0 3780
2 20437 88.6640 201.8252 0010285 502.6115 57.3972 14.20099943 66428
AO-16
1 20439U 90 5 D 91122.47208996 .00001024 00000-0 41897-3 0 2770
2 20439 86.6731 202.4576 0010885 309.3328 50.6876 14.29185843 66461
DO-17
1 20440U 90 5 E 91121.96499687 .00001157 00000-0 47064-3 0 2794
2 20440 88.6740 202.0372 0011782 310.4248 48.5835 14.29267592 56399
UO-18
1 20441U 90 5 F 91122.14653391 .00000930 00000-0 38140-3 0 2772
2 20441 88.6708 202.2637 0011394 308.1072 51.9081 14.29315062 56427
LO-19
1 20442U 90 5 G 91121.98343588 .00000928 00000-0 37882-3 0 2784
2 20442 88.6714 202.1569 0011196 309.2827 50.7277 14.29390739 56408
FO-20
1 20480U 90 13 C 91105.45830526 .00000074 00000-0 21687-3 0 1964
2 20480 99.0224 99.5356 0541696 83.6151 282.6307 12.83176352 55617
HUBBLE
1 20580U 91122.07137749 .00004445 00000-0 67935-3 0 4715
2 20580 28.4599 17.1623 0005104 200.3140 159.7237 14.87520088 55447
MET-2/19
1 20670U 90 57 8 91121.78331928 .00000507 00000-0 44578-3 0 2234
2 20670 82.5471 35.7673 0010707 109.0555 251.2405 13.83963660 42580
FY-1/2
1 20788U 90 51 8 91122.37577184 .00000008 00000-0 26848-4 0 1847
2 20788 98.9468 156.8504 0014546 304.0638 55.9151 14.01133746 33791
MET-2/20
1 20870U 90 85 8 91121.63824373 .00000363 00000-0 32087-3 0 1749
2 20870 82.5292 334.9235 0014404 16.0817 344.0784 13.83342130 29778
AO-21
1 21087U 91122.45492809 .00000283 00000-0 29809-3 0 729
2 21087 82.9387 267.5573 0035084 28.2952 332.0147 13.74739605 12748
RS-12/13
1 21089U 91 7 8 91121.62227182 .00000210 00000-0 21213-3 0 738
2 21089 82.9237 138.7019 0030079 50.5266 309.8488 13.73893673 11730
MET-3/4
1 21232U 91 30 8 91121.80821025 .00000095 00000-0 00000 0 123
2 21232 82.5448 257.2558 0016933 166.9752 193.1873 13.15981761 1011

National Co-ordinator
Graham Ratcliff VK5AGR
Packet Address: VK5AGR@VK5WI
Information Nets
AMSATAustralia
Control: VK5AGR

Amateur check in: 0945 UTC
Sunday Bulletin commences: 1000 UTC
Primary frequency: 3.685MHz
Secondary frequency: 7.064MHz
(7.064MHz is the frequency presently in use)
AMSAT SW Pacific 2200 UTC Saturday,
14.282MHz

Participating stations and listeners are able to obtain basic orbital data, including Keplerian elements from the AMSAT Australia net. This information is also included on some WIA Divisional broadcasts.

AMSAT Australia Newsletter and Computer Software

The excellent AMSAT Australia Newsletter is published monthly by Graham VK5AGR on behalf of AMSAT Australia and now has about 340 subscribers. Should you also wish to subscribe, send a cheque for \$20 payable to AMSAT Australia addressed as follows: AMSAT Australia, GPO Box 2141, Adelaide 5001.

The Newsletter provides the latest news items on all satellite activities and is a "must" for all those seriously interested in amateur satellites. Graham also provides a Software Service in respect to general satellite programs made available to him from various sources. To make use of this service, send Graham a blank formatted disk and a nominal donation of \$10 per item to AMSAT Australia, together with sufficient funds to cover return postage. To obtain details of the programs available and other AMSAT Australia services, send a SASE to Graham.

From AMSAT HQ, 27 April 1991

UoSAT-F Combines Humanitarian Mission with Amateur Radio

UoSAT-F — now scheduled to be launched on 7 May — will support both amateur and non-amateur RF links. The satellite's primary non-amateur mission is to provide store-and-forward communications for SatLife, an organisation formed by 1985 Nobel Prize winner Dr Bernard Lown. SatLife will use UoSAT-F to start a non-profit electronic mail network for health professionals. Initially, five African medical schools will use "HealthNet" to exchange electronic mail and receive up-to-date medical literature. HealthNet is a direct application of store-and-forward satellite communications techniques developed within the Amateur Service.

When not serving HealthNet on non-amateur frequencies, UoSAT-F will transmit and receive on Amateur Satellite Service channels. It will transmit and receive AX.25 data

using 9600 bit/second FSK modulation. The uplink is on 2m, and the downlink is on 70cm. This is the same frequency plan and modulation used on UoSAT-OSCAR-14. Stations already equipped for UO-14 operation will be able to receive UoSAT-F with the same software and hardware they already use. Many of the 100 stations now active on UO-14 found the implementation of 9600 bps FSK much easier than expected, so newcomers shouldn't be frightened of this high speed technology.

UoSAT-F will transmit telemetry, status messages and files in the pattern typical of UO-14. Telemetry and status messages will be in the same format as that on UO-14, files will be broadcast using the PACSAT Broadcast Protocol. This protocol is already in use on PACSAT, LUSAT and UO-14.

UoSAT-F's role in the amateur satellite service will be similar to that of UO-9, UO-11 and WEBERSAT. Instead of providing a two-way communication service, it will transmit experimental data and telemetry. The most exciting aspect of this mission will be the charge-coupled device (CCD) camera. UO-F's CCD camera design incorporates all of the lessons learned from previous UoSAT CCD experiments. It has a wide-angle lens (110 degrees) providing a field of view only slightly

smaller than the satellite's footprint. Images will measure 1600 by 1800km, making identification of ground features much easier than on previous cameras (UO-9 and WO-18). The image will be 578 pixels by 576 pixels, providing ground resolution on the order of 2km. Each pixel is eight bits, giving a black-and-white image with 256 levels of grey.

UO-F will broadcast CCD images routinely using the standard PACSAT Broadcast Protocol. The two Transputer microprocessors in the CCD camera module will take the image and send it over an on-board network to the main 80C186 onboard computer (OBC186). The OBC will put the image into a file, with 256 bytes of image header information and a standard PACSAT File header. This file will then be broadcast. For those interested in writing their own display program, complete technical details of the image file contents will be published soon. When we have confirmed that the camera is working, we'll release a display program for PC compatibles. (We'll actually distribute this software over the satellite using the Broadcast Protocol, "bootstrapping" ground stations).

The wide-angle, black-and-white CCD camera on UoSAT-F will complement the WEBERSAT camera. Taking advantage of the

stable, Earth-pointing UoSAT bus and the 9600 bit/second downlink, it should provide very interesting results for experimental and educational users.

We will broadcast progress bulletins on UO-F's amateur downlink as soon as we have the Housekeeping Integration Task (HIT) loaded — probably on the first day of operations.

UoSAT-F Frequency Plan

Downlink
435.120MHz
9600 bps FSK
1200 bps AFSK (backup)
5W or 2W
Uplink
145.900MHz
9600 bps FSK
1200 bps AFSK (backup)

Note: This channel will be used by ground stations transmitting "hole lists" and requests for the PACSAT Broadcast Protocol. There should be little interference with the Microsat uplink on the same frequency.

73s from Maurie VK5EA

ar

For Feb/March Satellite activity please see P55

March IARU MS Summary 1991

Date	Time UTC	Frequency in kHz	Call sign if Heard	Mode	Logs X	Details of Traffic if Known and Any Other Information
0503	1200	7002	"V"	A1A	19	Beacon
0503	mmi	7010	UMS	Vari	16	F1B/R7B various shifts on F1b
2103	1030	7014		Vari	4	Numbers t/c
2903	1005	7015		R7B		4kHz wide b/cast stn
0603	1350	7020		A3E	2	B/c SE Asian
2303	1223	7025		A3J		Asian voices distorted B/c stn
2703	1525	14003		A3	1	Foreign Telephony (no details)
dly	mmi	14023		F1B	61	24-hr stn 250Hz shift/RYS
dly	mmi	14028		N0N	41	Carrier for telephone
0203	mmi	14030+				This intruder is the same as on
14048 ...	does a freq change					
1203	mmi	14048+		A3J	27	R/telephone with tones
dly	mmi	14051		J3E/L	36	Asian R/T
dly	mmi	14058+		A2	64	24-hr dual TX
dly	1030+	14070	VBX	A1A	13	Traffic
1803	0615+	14072		A1A	3	UAMZ/UCBN/EYMJ/all new (VRQ??)
dly	dly	14075+	VRQ	A1A	50	News B/c re Gulf war (Vietnam)
2303	0130+	14096	VPC	A1A	10	BQ of VPC
2603	0900+	14100	NZB	A1A	14	Outside norm sked contact
0103	0706	14140		F1B	5	RTTY shift unknown
1403	0900	14120	...	A1A		Dly c/s change SHWR/ONAM/VDQC
1003	0700	14140.5	UUMS	A1A	7	C/c in CW. F1B various shifts
2103	1000	14200	VMO	A1A	7	T/c only
2303	1000	14215	HSM	A1A	11	No further info — more pse
0403	0518	18070	P0N			The new woodpecker is with us!
0103	1143	18080	A3E			Radio Moscow
0803	1305	18120	A3E			B/c in Eng/Foreign Lang lessons
dly	0200+	21032	UUMS	A1A	34	20 hrs/day Moscow NR USR
0103	0740	21283.5	UUMS	A1A	33	18hrs/day Moscow NR USR
0503	1124	21450	RMWS	A3E	15	Radio Moscow World Service USR
0303	0724	28980		A3E	7	B/c Ch talk/music. No ID

Logs from: VK2s 2EY1, 3C1S, 4BG, 4AKX, 4BHJ, 4BTW, 4BXC, 4CAS, 4EKA, 5TL, 6RO, 6XW, 6BEK, 6BW1 and 7RH. On behalf of the Monitoring Service, my thanks. Gordon VK4KAL Fed Co-ord.

INTRUDER WATCH

GORDON LOVEDAY VK4KAL
FEDERAL INTRUDER
WATCH CO-ORDINATOR
'AVIEMORE' RUBYVALE 4702

Intruders QSY

Some notable intruders are vacating their usual illegal frequencies. It seems conditions do not favour them (which is good news), but we still will have to put up with them on another band. UUMS 7008 F1B and R7B signal appears now on 7010+/-, being 30 per cent of time on air. The RT station of 14048 is back after a sojourn on 14027/30. UUMS from 14140.5 has not been heard as much as previously, but 21032 is still as active as ever. Moscow Naval Russia runs RYS and leaves a carrier for about 18 hours a day on 21283.5. Many spurious and harmonic signals are heard in the 7.000 to 7.046 portions, from a variety of sources. Likewise, 14MHz has many more intruders using "home-brew" call signs. A lot of non-amateur activity took place between 14060 and 14110MHz.

An upsurge of commercial broadcast stations took place on 28-30MHz. The greatest offender was Radio Moscow World Service (I certainly would like to see the WIA push for greater use of this band by novice operators and "K" calls, seeing that full calls are showing NO interest in using this vast area.

On 21450 we are again seeing the encroachment of foreign broadcasting into our legal band; admittedly only just inside, but if we do not get action going to curb it now, next year they could be all the way — so get down there on CW and pour your full legal power into them.

ar

EMC

HANS RUCKERT VK2AOU
EMC REPORTER

25 BERRILLE RD BEVERLY HILLS 2209

1) QST reports on the attempt by some members of the US Congress to protect permanently by law the amateur-radio-frequency-spectrum (March 1991). This would solve forever the problems of interference by intruders, the struggle at the Geneva WRCs to retain amateur frequency bands, the interference caused by and to cable-TV companies and service operating on exclusive amateur bands (channel 6, 2m band), provided the frequency spectrum organisations of other countries follow the US example. Why not, when the authorities protect appliance users from the legal, but unpopular, radiation from amateur radio stations, caused by inadequate appliance design?

2) Radio amateurs, operating on VHF/UHF bands frequently observe severe interference from their own computers, and from those in their neighbourhood. The interfering pulses appear over the whole 2m band, often making OSCAR operation impossible. All ingoing and outgoing cables should be wound on ferrite cores to form rf chokes. If the computer comes in a metal case, earthing of the case may help. In the worst case, the computer may have to be placed in a metal box, which is earthed, and which encloses the computer as much as possible. Using a different AC power outlet for the receiver/transceiver and the computer in the shack can sometimes help, too. These steps have already been described for the VCRs, to reduce susceptibility.

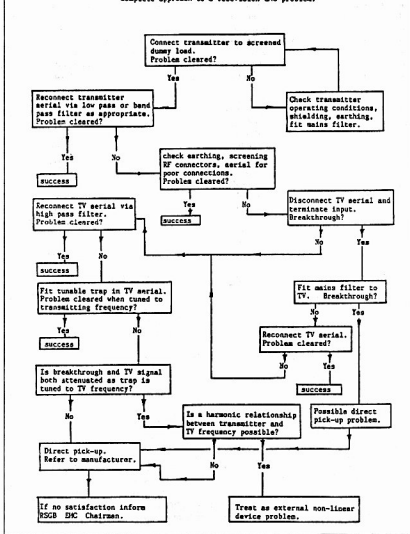
3) Cable-TV contra amateur radio on the 2m and 70cm amateur band: CQ-DL 4/1991 brings a leading editorial report by Dr Ing H Schmücker DK5ML, vice-president of the DARC "Interference". The same magazine brings a 3 1/2-page comprehensive paper with many literature references from several countries on the cable-TV interference problem. The frequency allocating authority "FTZ" (Fernmelde Technisches Zentralamt) is apparently inclined to believe the claim of the cable-TV companies that their system is RF-leakproof, because the government gains financially from this service, and more entertainment makes politicians popular. This was so 2000 years ago in Rome (bread and circuses!). When it comes to science and technology matters, hopes and beliefs are not good enough and often unreliable. The whole 2m band is affected by cable-TV-channel 6, also interfering carriers from FM-relay transmitters cause trouble on 433.05-433.79MHz. Cable-TV on the D2 MAC-Norm would be used, and interference on 28-29.7MHz is expected (amateur 10m band). The use of exclusive radio amateur bands is for the cable-TV companies only a commercial profit matter. The promise by the cable-TV companies that they will attend to

interference cases sounds good, but experience has so far shown that unwanted leakage radiation, as well as penetration by the signals from other services, could usually not be sufficiently reduced to permit, for example, amateur satellite communication, where high receiver sensitivity and high transmitter ERP are required. The US experience with channel "E" on 145.250MHz has already shown some years ago that most leakage problems were due to low quality of the leaking coaxial cable going to the houses from the main supply cable along the road, and the use of low quality coaxial

plugs at the TV sets. But, even improved installations at best merely reduced the worst interference. The DARC held a "Channel-6 Working Conference" at Gladbeck, because the densely populated Ruhr River industrial region is completely covered by cable-TV-channel-6. What could one do with the costly VHF/UHF equipment and antennas, if all capital cities are covered with interference from cable-TV? It could not be sold, being also useless to otherwise potential customers. The battle goes on in DL.

4) From Radio Communication, UK, April 1991 (submitted by Norm Burton): We know that the European Commission EMC Directive is better than nothing (present state), but it is only a limited step in the right direction, because experts have established than an immunity level of 10V/m in the test cell would be fully satisfactory, whilst Germany had in-

Complete approach to a Television EMC problem.



roduced 3V/m field strength years ago, mainly due to the efforts of DL1BU and DL9TJ. Now the European Commission does not even request the level of immunity under test-cell conditions. The most amazing outcome of this is that there is likely to be a transition period of four years, ending on 31 December 1995. A large number of people in the electronics industry — who have not done anything to improve their products — would have ap-

plauded this announcement. What will happen during this four-year period?

5) Other paragraphs of this EMC Report by G4JKS deal with RF noise-cancellation methods, equipment performance and its limitations.

6) PCB-High-Pass Filter: Using printed circuit board material as the filter base and earth terminal, and the other side as capacitor electrodes, has the advantage that capacitor

self-resonances, so often obtained with other capacitors (discs etc), are avoided. These filters can be effective even at UHF.

7) A Flow-Diagram showing the necessary step-by-step investigation to find the cause and remedy of TV reception disturbance is a most helpful guide, and is very much recommended.

SPOTLIGHT ON SWLing

ROBIN L HARWOOD VK7RH
52 CONNAUGHT CRES WEST LAUNCESTON 7250

Well, we are in the middle of winter and already I have noticed a drop in the signal levels on the higher bands in excess of 17MHz. This is mainly due to the slow decline of the solar flux. Although there were some surprises in the latter part of April, with exceptional propagation on 50MHz. There were some epic QSOs between Australian hams and those located in the Pacific, North and Central America, Japan and Africa. Who said that six metres was dead!

Incidentally, there are going to be major alterations to the maritime HF allocations. Although the bands are largely unchanged, the position of various services within these allocations will alter. For example, the RTTY/SITOR signals will shift further away from the Radphone allocation. The 1995 deadline, when CW will be largely phased out, will see many coast station frequencies primarily utilising SITOR and other digital modes. So there will be fewer CW frequencies after 1 July. Also you will notice that the 25MHz maritime allocation will have many more signals than at present. Up till now, the only stations on that

band have been in Scandinavia, yet the American coast stations, WCC and KPH, have been heard with marker signals and SITOR pulsers.

Although much maritime analogue and digital traffic is being increasingly carried via satellite, the costs are still prohibitive for the smaller operators, who still prefer to use the cheaper and technically limited HF service, which is still prone to propagation disturbances.

I noted on a recent BBC "Waveguide" program that the BBC External Services uses 110 separate transmitters to radiate its programming worldwide. The same program informed that there is increased co-operation between the major broadcasters to share frequencies and minimise co-channel interference. Regular meetings are planned to co-ordinate seasonal frequency alterations. The recent Prague meeting saw broadcasters from East and West overcome some difficulties with co-channel interference. It is hoped that other regional broadcasters will also meet to make suitable frequency arrangements.

As you are aware, the need for such hu-

manitarian organisations such as the Red Cross have been amply demonstrated in recent human and natural disasters, such as in Bangladesh, Africa and the USSR. The Red Cross Broadcasting Service has scheduled monthly test broadcasts to this area. They are as follows:

0740 to 0757 UTC on 9560, 13685, 17670 and 21695kHz on 27 and 30 May, 1, 4 and 29 July, and 1, 26 and 29 August. There is also a release between 1040 and 1057 UTC on the same dates on 13635, 15570, 17830 and 21770kHz. All of the above have been made available by Swiss Radio International. From 1310 to 1327 UTC, the service is on 7480kHz, but is from Radio Beijing. Senders in Moyabi, Gabon and Radio Bras, in Brazil are also used at other times.

Just after 0700 UTC on 6 May 1991, Australian Standard Frequency and Time Station, VNG, at Llandindis NSW ceased to operate on 15MHz and was to reopen on 16MHz, 36 hours later. According to last month's AR, the 10 MHz signal was going to close down and also eventually be on a new standard frequency. The 5MHz signal was continuing unchanged.

Well, that is all for this month. If you have any news, just drop me a line, to the above address or via Packet, to VK7RH @VK7BE-1. Until next time, the very best of listening and 73 — VK7RH.

EDUCATION NOTES

BRENDA EDMONDS VK3KT
FEDERAL EDUCATION CO-ORDINATOR
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At the recent WIA Federal Convention the topic of examinations was raised by a number of delegates. Some Divisions expressed their dissatisfaction with the current arrangements for various aspects of the devolved system, and several proposals were advanced for improvements to either the question banks, the paper-generating program or the accreditation process. It was generally agreed that the system has become much more complex than was envisaged in the early stages of discussion with DoTC.

Some of the complaints have already been raised formally with DoTC by the Division or examiner concerned. Others are of the "they

orta..." or "why don't they..." type. In any new or revised system there will always be complainants who know how it should be done by others, and allowance must be made for these in any assessment of the success of the project. However, there is cause for concern when there is a general expression of dissatisfaction from those who are working hard to make the system viable.

In his talk to the convention on future aspects of DoTC/WIA liaison, David Hunt, Manager, Licensing, from DoTC accepted that there had been problems which were originally not apparent, and agreed that an evaluation of the development processes might be

appropriate at this stage. As a result, the WIA is now committed to evaluating the system from the position of the examiners.

So here is the "commercial". Input is urgently needed from any and all who have been involved in any way with production or administration of examinations of all types, and it is needed as soon as possible, as I need to have a draft report ready for the July Executive Meeting.

I already have comments from a small number of members who have made the effort to keep me informed. But this project will need as much as can be collected, and is seeking both positive and negative comments. Also, as well as comments on the present system, ideas or proposals for improving the system will be most welcome. It is taking the easy way out to simply criticise without offering constructive alternatives.

If you have modified the generating program, had extra questions approved, improved

the CW production program, found a simpler way of completing the paperwork or have any similar ideas which you are prepared to share, please send them to me at the above address (NOT the Callbook address) or at the Executive Office at Caulfield. What I am really asking for is a report on what the examiners are now doing, explanations of their complaints, and their suggestions for future improvements. Suggestions from members not involved in examinations will also be welcome, of course, but I expect that those who have had

"hands-on" experience will have more to offer.

On a different tack, with WIA was recently approached by the Australian Science Teachers' Association about a publication being prepared for "Science in Schools Week" in August. A booklet on communications now being produced for distribution to schools has a small segment on amateur radio which is being sent to us for approval. So, please be prepared and co-operative if your local school approaches you for advice, ideas or assistance in the next few weeks.

I did not get much response from members last year to my suggestions for introducing amateur radio into schools. Perhaps later this year will be an appropriate time for follow-up contact with schools to maintain any interest that may be stimulated by the ASTA program above. Ideas, comments and feedback from any who have participated in such schemes would be most welcome. I look forward to hearing from you.

REPEATER LINK

**WILL MCGHIE VK6UU @ VK6BBS
21 WATERLOO CR LESMURDIE 6076**

In the last edition of Repeater Link I included a circuit of an audio automatic gain control amplifier. In this basic form it is a useful addition to your repeater's audio quality. Further additions to the circuit add frequency tailoring. The frequency compensation was designed to work in conjunction with direct frequency modulation of the transmitter's crystal oscillator, but may improve the audio response of a phase modulator.

VR1 sets the amount of high frequency cut

VR2 sets the amount of audio compression

VR3 sets the amount of low frequency cut

VR4 sets the amount of overall audio gain

When a positive voltage is applied to pin 4 (WIA NEWS), Tr1 is turned on, placing C6 in circuit. This increases the time constant in the audio AGC loop, so as to reduce the compression

during WIA news broadcasts. A fast time constant is not advisable for broadcasts. If your repeater does not carry the WIA news, this function is not needed.

When a positive voltage is applied to pin 5 (mute), the audio is muted. Depending on your repeater setup, this is optional.

Adjustment of the overall frequency response can be done by ear. Comparing the input and output audio from your repeater, and making adjustments to the high frequency and low frequency, will produce good results. Another method is to compare the unmuted audio noise from a monitoring receiver to the unmuted audio noise from your repeater's receiver, as transmitted by the repeater. I hope you can understand the last sentence. To put it another way, open the mute on your

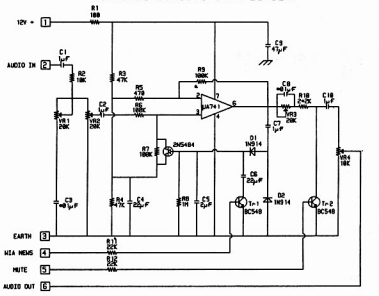
repeater. Open the mute on a separate receiver; switch this separate receiver between the repeater's output and a vacant channel. If you have a good ear in interpreting "white noise", lows and highs, then adjust VR1 and 3 so that the repeater's audio sounds like the monitor receiver's audio, on the vacant channel.

The DC voltage on pins 2, 3 and 6 should all be half supply rail if the DC connections are correct to the IC. The connections to the 2N5484 FET seem to make no difference which way around the source and drain are. The drain to pin 3 of the IC is probably the correct way.

Trust you will find this circuit of some use in improving the audio quality of your repeater.

Do you have any simple circuits that are used in your repeater that you would like to share? If so, please send them to me. Simple hand drawings would be all right, as I can redraw them onto the computer.

AUDIO CONDITIONING AMPLIFIER



Book Bargains

When the Magpubs operation was transferred from the Executive Office to Divisional Bookshops, the following books were left over. Here is your chance to buy them at a bargain price.

- RSGB Amateur Radio Operating Manual, Third Edition
- Five left @ \$16.25 each (normally \$25.20) plus postage \$2.80
- RSGB Radio Data Reference Book, Fifth Edition
- Nine left @ \$19.00 each (normally \$32.40) plus postage \$2.80
- RSGB Radio Communication Handbook, Fifth Edition
- Eight left @ \$44.75 each (normally \$50.40) plus postage \$5.00

Please send orders to:

Book Sales
WIA Executive Office
PO Box 300
Caulfield South
Victoria 3162

KNUTSHELL KNOWLEDGE

GRAHAM THORNTON VK3IY

A brief overview of what other magazines have to say. All of the items given below are available in the Executive Office Library. As a special service to **Members Only**, a photocopy of any complete article is available for \$2.50 posted. To circumvent any copyright problems, please be sure to state 'The information is required for the purpose of private study'. Address your request to 'The Librarian, Executive Office WIA, PO Box 300, Caulfield South Vic, 3162.'

Antennas

- Computer Software

The ELNEC Antenna Modeling Program. Bill Clarke WA4BLC, 73 issue #364 Jan 1991 pp 52 - 54. il graphs. A user friendly menu program based on MININEC, which calculates near and far fields for any antenna configuration, both for perfect and real ground. Antenna input impedance can also be calculated. It is designed for use with IBM PCs; with a graphics board, plots can be reproduced on a printer. Program is commercially available for US\$50.

- Mechanical Details

Low-Cost Mag-Mount. Phil Salas AD5X, 73 issue #364 Jan 1991 pp 55 - 57. il diags. A design for a magnet mount with BNC connector. A suitable 2m/70cm dual band antenna is described for fitting to the mount. A cellular antenna, and a 10m converted CB antenna are also described.

- Microwave

An Inexpensive 10 GHz Dish System. Jerry Jensen WT0W, 73 issue #365 Feb 1991 p 57. A description of the plumbing necessary to couple a wave guide to a 10 GHz dish, using hardware store materials.

Pour an Antenna for X-Band. John M Franke WA4WDL, 73 issue #365 Feb 1991 pp 48, 50. il diags and photos. A description of the technique of producing lenses by casting paraffin wax. Although the material is opaque to light, it is transparent to microwaves; such a lens gives concentration of microwave energy.

- VHF/UHF

A Whip Antenna for 2 Metres and 70cm. Tom Moffat VK7TM, EA vol 52 No 4 April 1991 pp 82 - 87. il graphs and photos. A design for a dual-band whip antenna for use with a hand-held via a BNC connector. It is constructed from the inner (solid) conductor of co-axial cable, and acts as a 5/8 wave on 70cm and a loaded quarter wave on 2m. Careful trimming of length gives an acceptable SWR on both bands. Performance superior to a 'rubber ducky' is claimed.

- Yagi

The Building Supply Yagi. Jack B Morgan W1FEA, QST vol LXXV No 3 March 1991 pp 22 - 24. il diags, graph and photo. Mechanical design details are described for a two element, low cost monoband Yagi, suitable for use on 10, 12 or 15m.

Computers

- Accessories

A Parallel Port I/O Board. Wally Gardiner VE6BGL, 73 issue #364 Jan 1991 pp 29 - 30, 32. il diags and photos. An interface which allows an IBM computer to control various electrical devices, either by a power transistor or a transistor-switched relay. Provision is made for feedback information, such as coffee pot temperature, to be fed back to the computer via the interface. Software is described for a testing program and a Morse code keyboard program.

- Software

Skymoon - Software for EME Communications. Dick Goodman WA3USG, 73 issue #366 March 1991 pp 40, 42. il photos. A product review for a commercial program, which provides on-screen information such as azimuth and elevation, to assist EME operators.

The WB2OPA LogMaster. Jeffrey A Meyer N8AHA and Bill Brown WB8ELK, 73 issue #364 Jan 1991 pp 34 - 35. il photos. A Product Review for a versatile HF logging program for an IBM PC supplied by 'Sensible Solutions'.

Electronic Devices

High Security IR Remote Control Switch.

Robert Priestley, EA vol 52 No 4 April 1991 pp 56 - 61. il cts, cmpts, pcbs and photos. An independent transmitter receiver combination which may be used to hold a relay closed when signal is present, or toggle apparatus on/off. Digitally pulsed 28 kHz signals are transmitted. Half a million different codes are possible, offering high security.

Filters

Transceiver Features That Help You Beat Interference. David Newkirk WJ1Z, QST vol LXXV No 3 March 1991 pp 16 - 21. il cct and graphs. A review of the various filter options available with modern transceivers and the techniques of using them to best advantage in interference reduction.

Packet

Packet with the Microsats. David Medley KI6QE, 73 issue #366 March 1991 pp 9 - 10. il cct. A general discussion of the

software requirements to use packet with Microsats. A circuit modification is given to enable a PK-232 to receive UoSAT-OSCAR 11 telemetry data.

Power Supplies

The Three Terminal Regulator. E R Doublek N9RF, 73 issue #364 Jan 1991 pp 40, 58. An elementary application guide to the use of three terminal regulators as voltage and current regulators.

Receivers

- Accessories

Touch-Tone Activated Scanner. Don Moser AA7Y, 73 issue #366 March 1991 pp 30, 32, 34. il ccts, cmp and photo. A modified DTMF decoder and scanner provides a system that opens the receiver squelch only on receipt of a predetermined DTMF signal.

- Microwave

Radar Detector to Microwave Receiver Conversion. Steve J Noll WA6EJO, 73 issue #365 Feb 1991 pp 10 - 12. il ccts, cmp, graphs, pcb and photos. A technique is described to convert a Bell KKR radar detector to a 10GHz amateur receiver.

Satellites

- Microwave

Elementary Mode S. Ed Krome KA9LNV, 73 issue #366 March 1991 pp 21 - 22, 24, 26, 28. il cct, diags and photos. A general outline of transverter operation for 13m is given. A specific design is presented for a loop Yagi antenna for use on the same band.

- VHF/UHF

Tuning OSCAR with Separate Radios. Paul Summers KB3ML, QST vol LXXV No 3 March 1991 pp 25 - 27. il ccts and graphs. A system that enables the VHF uplink and UHF downlink frequencies to be controlled with one tuning knob. An optical rotary encoder determines setting of control knob. The up/down microphone connections are used to control each transceiver.

- Weather

Weather Satellite Reception. John E Hoot N6NHP, 73 issue #366 March 1991 pp 12, 14. il photos. Article describes modifications to commercial scanners necessary for reception of images from orbiting weather satellites on frequencies between 137 and 138 MHz. NBFM equipment is too narrow for the deviation used by these satellites.

Technology

- Earth - Moon - Earth

Two Meter EME Primer. Dave Blaschke W5UN, 73 issue #366 March 1991 pp 46, 48, 50, 52 - 53. il diags and photos. A general

discussion on how to get started in EME. A specific design is given for a stack of four 11 element quasi array, suitable for EME.

- Miscellaneous

Making Soldering Safer. Dr Bryan P Bergeron NU1N, QST vol LXXV No 3 March 1991 pp 28 - 30. il Photo. A cautionary article about the dangers associated with soldering. Asthmatics can become sensitised to resin flux fumes and decomposition products from plastic insulation. Lead poisoning is possible, not from vapour inhalation, but by transfer from hand to mouth.

- Transformers

Rewinding Output Transformers. Peter Lankshear, EA vol 52 No 3 March 1991 pp 118 - 120. il diags and photos. Detailed information is given for the rewinding of valve type output transformers, using simple home equipment.

The Basics of Transformers. David Botto, EA vol 52 No 4 April 1991 pp 90 - 94. il ccts, diags and graphs. An elementary review of the construction and operation of power, AF, IF and RF transformers.

Test Equipment

- Dippers

UHF Source Dipper. Martin Beck WB0ESV, 73 issue #365 Feb 1991 pp 20, 22. il cct, diags and photos. A design for a dipmeter which covers the frequency range 400 - 500 MHz. The active device used is a 2N4416.

- Field Strength Meters

UHF Field Strength Meter. Martin Beck WB0ESV, 73 issue #365 Feb 1991 p 24. il cct, diag and photos. A practical design for a FSM covering the range 400 - 500 MHz. A coaxially coupled wire loop is used as the pick-up coil.

- Frequency Meters

High Precision Frequency Standard. Gardner Johnson, 73 issue #364 Jan 1991 pp 9 - 10, 12, 14. il ccts, cmp, photos and pcb. A design for the generation of a high precision 1 MHz square wave, for calibration of frequency counters and digital frequency displays. The ultimate reference is a rubidium frequency

standard used by each of the four major TV networks in the USA. The horizontal sweep oscillator of any colour TV set is synchronized to this reference, at a frequency of 17.7342657343 kHz. A simple ferrite loop is used to access this oscillation. The long term accuracy of the reference is claimed to vary less than one part in 10^{11} per month. (On a time equivalent basis, this represents a drift of one second in 31 centuries!)

The loop signal is compared in a PLL to provide a 1 MHz square wave output.

- Miscellaneous

An HF/VHF/UHF Marker Generator. J Frank Brumbaugh KB4ZGC, 73 issue #364 Jan 1991 pp 27 - 28. il cct, cmp and pcb. A circuit, based on Motorola K1160A crystal oscillator, provides harmonic rich rectangular wave outputs at 6MHz, 1MHz, 100kHz, 50kHz, 25kHz and 10kHz.

- Product Reviews

APPA 90 Series Series Handheld DMMs. EA vol 52 No 4 April 1991 pp 88 - 89. il photos. A comprehensive review of models 93 and 98.

MFJ SWR Analysers. Bill Clarke WA4BLC, 73 issue #364 Jan 1991. A review of MFJ-207 HF and MFJ-208 VHF portable SWR analysers. The units contain an in-built oscillator, and can be used to check SWR directly at the antenna, where adjustments can be made. It is claimed that the antenna system can be pre-tuned without signal radiation.

Transceivers

- Microwave

SHF Systems Linear Transverters for 1240 and 2304 MHz. (Product Review) Peter H Putman KT2B, 73 issue #365 Feb 1991 pp 40, 42. il photos. A review of a transverter kit suitable for conversion to and from 2m.

- Product Reviews

Kenwood's TM-941A Triband FM Transceiver. Ron Hranac N0IVN, 73 issue #364 Jan 1991 pp 36, 38 - 39. il photos. A report of the examination of this transceiver, which operates on 2m, 70 and 23 cm.

The ICOM IC-970H VHF/UHF Multi-band All-Mode Transceiver. Joe Holman KATLDN, 73 issue #366 March 1991 pp 36, 38 - 39. il photo. A review, without measurements, of 35/45W transceiver, which has 1.2 GHz band as an optional extra, together with an optional 50 - 900 MHz receive only function.

The Kenwood TH-27A. David Cassidy N1GPH, 73 issue #365 Feb 1991 pp 28, 30. il photo. A report, without test measurements, on the design and application of this miniature hand-held.

Yaesu FT-1000D MF/HF Transceiver. James W (Russ) Healy NJ2L, QST vol LXXV No 3 March 1991 pp 31 - 36. il graphs and photo. A comprehensive review of this equipment. Measured results are compared to specifications.

- QRP

A Station T/R Controller. Michael Bryce WB8VGE, 73 issue #365 Feb 1991 pp 63 - 64. il cct, cmp, pcb and photos. A QRP station controller which provides power conditioning, sidetone generation, loudspeaker output and transmit/receive keying with appropriate delays.

Thanks to those who have expressed appreciation of this column. We'll try to keep it going.

Glossary of abbreviations

il	The article contains illustrations, a list of which follows.
cct	A circuit diagram
cmp	A component layout drawing
EA	Electronics Australia
diag	A mechanical drawing
pcb	A master drawing from which printed circuits may be produced
QSTVE	QST Canada
73	73 Amateur Radio Today

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DIVISIONAL NOTES

VK2 NOTES

TIM MILLS VK2ZTM

New Council

The deferred closing date for council nominations and AGM resulted in sufficient personnel to fill the nine positions for the incoming council. The AGM is now to be held 1 June at 2pm at Parramatta as advised in the insert to May *Amateur Radio* which also contained the meeting notice and agenda, annual reports and balance sheets. The back page contains the QSL Bureau notification—please

complete and return. On the same page is your membership card. This you RETAIN. Several were returned with the QSL notification. If you were one who did, you can collect it from the office or send in a stamped self-addressed envelope.

Broadcast Relays

We are looking for more clubs to provide relays to their local repeaters in country regions. If you can assist, please contact the Divisional Office. We are thinking about conducting some tests to the HF bands of 20, 17, 15 and 12 metres of the VK2WI broadcasts. These will expand our Australian and Pacific region coverage. Currently the facilities do not

exist at VK2WI for the extra bands, so we are looking for groups of amateurs to provide suitable relays on our behalf. If you are able to receive one of the VHF/UHF signals from Dural and have an audio patch system, then get in touch with the office if you can assist.

Happenings

The Oxley Region field day at Port Macquarie over the June holiday weekend 9-10 June ... Sydney regional club meeting at Parramatta Saturday 15 June ... 80th dinner 28 June ... Planning still under way for next AUSSAT/Gladesville ATV test; the next may have a NASA theme. Listen to your local divisional broadcast for the date ... UHF repeater VK2RPM has been commissioned on Ch 8525 to serve the lower north coast. VK2RSD is operational from Nowra on UHF

Ch 9275, beaming south. VK2RUW on Ch 8225 has moved to higher ground in the Wollongong region.

New Members

A warm welcome is extended to the following who joined the NSW Division during April.

G K A Bell	Assoc	Pesta Ridge
B P Anthones	Assoc	West Wyalong
G Baurhenn	VK2JAP	Blacktown
N T Cheers	VK2MKA	Kempsey
M K W Cheung	Assoc	Beverly Hills
R Collins	Assoc	Mainly Vale
R Cowdery	Assoc	North Sydney
J Glenn	VK2AIO	Tweed Heads Stn
M Griffith	Assoc	North Epping
I C Griggs	VK2JCW	Castle Hill
I B Hains	VK2GKZ	Dee Why
D A Holyoake	Assoc	Turross Head
B L Manton	Assoc	Mt Pritchard
N W Marr	Assoc	McMahons Point
R J Mills	VK2KRJ	Tamworth
R W Parry	VK2XVB	Rainbow Flat
W C Roaser	VK2ZWR	Northmead
P A Seifert	VK2MKG	Bateau Bay
R J Snare	Assoc	Blacktown
S G Straghan	Assoc	Holsworthy
G L Towell	Assoc	Nambucca Heads
M H Turner	VK2KTH	Ingleburn

80th Anniversary of the WIA

NSW Division

As foreshadowed in previous broadcasts, and these notes, the NSW Division will host a special anniversary dinner to celebrate the Institute's 80th anniversary.

It will be held on Friday, 28 June at the fabulous Darling Harbour Convention Centre. It promises to be a memorable occasion; the venue overlooks Darling Harbour, with city lights in the distance. Enjoy a top-quality three-course meal, a few convivial drinks, a little light dinner music and perhaps a spot of after-dinner dancing! This will be a social occasion not to be missed.

Darling Harbour is well-served by public transport, and for those driving, plenty of parking is available at parking stations close by.

Tickets cost \$49.50 a head and you can book through the Divisional Office at Parramatta. Phone up and "pledge your plastic", that is — use your credit card — on (02) 689 2417, or send a cheque to PO Box 1066, Parramatta 2124, by 14 June.

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5/8 WAVE

JENNIFER WARRINGTON VK5ANW

TTP Club Update

The TTP Club, as mentioned last month, now has an official title. It is the *North Eastern Radio Club* or *NERC* (not to be confused with the VK3 NERGs, with which we compete at SERGI). If you would like to be a NERC, ring Frank VK5NFA on 251 4776, or Peter VK5PBD on 264 1070.

Did You Know ... that at the Royal Adelaide Exhibition 1952 the SA Chamber of Manufactures awarded a certificate and medal to the WIA SA Division "For an exhibit of very high order of merit". It would be nice to think that we could have had a similar display at the Hobby Fair on 22-23 June 1991, but at the time of going to press we had only one volunteer, so ... please contact a member of council urgently and see if there is still time.

1991 Council

Council members for the coming year are: Rowland Bruce VK5OU (President), John McKellar VK5BJM (Secretary), Bill Wardrop VK5AWM (Treasurer). (Other positions to be advised). Don McDonald VK5ADD, Bob Allan VK5BJA, Peter Maddern VK5PRM and Ian Watson VK5KJA are all continuing members, and we are pleased to welcome two new members, Mark Spooner VK5AVQ (currently also one half of the ESC team) and Rob Gunnourie VK5FL.

Reps for clubs include Bill "Spud" VK8ZWM for the Darwin Club when he's in town, and Harry VK5AHH (when Spud's not), and Bill VK5AWM is the rep for LEPARC.

Ashford Hospital seems to have had more than its share of amateurs as patients lately, including Spud VK8ZWM, Alan VK5NNM and Michele VK5ZYL (my daughter-in-law). I am pleased to say that all are now out and on the road to recovery.

Phone BBS

In case you would like to log on to the phone BBS the number is (08) 259 1359. You may not be able to access it first time up until your WIA membership has been accredited and entered.

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VK7 NOTES

FRANK MOORE VK7ZMF

VK7 Snippets

The VK7 Divisional AGM was held on 23 March 91 with a rather large attendance.

An election was held, with the following being elected to council.

President	VK7AL	Tom Allen
Secretary	VK7EB	Ted Berr
Treasurer	VK7ZPK	Peter King
Federal Rep	VK7JG	Joe Geiston

Broadcast Officer	VK7JK	John Rogers
Council	VK7JH	Jim Hiley
	VK7NBU	Bob Harding
	VK7ZMF	Frank Moore

Ex-Officio Council Members:

VK7BE	Barry Hill
VK7PU	Phil Harbeck

This represents a fairly diversified section of amateurs spread throughout the state, including the north, north-west, west coast and south. Wishing all council members a productive year.

Also, a warm welcome to new members H M Rogers VK7DU and T E Spargo.

Packet Radio BBSs and Digipeaters VK7	
VK7BBS	Launceston, North Tasmania Sysop VK7AE Andre
VK7EKA	George Town, North Tasmania Sysop Mervyn
VK7ZBA	Cranbrook, East Coast Sysop Bruce
VK7ZTA-I	Hobart, Southern Tasmania Sysop Anthony
VK7GL-I	Hobart, Southern Tasmania Sysop Andrew
VK7BE-I	Launceston, Northern Tasmania Sysop Barry
VK7RTY	Digi-Peater, Northern Tasmania Mt Barrow
VK7RIT	Digi-Peater, Southern Tasmania Mt Wellington

ar

QSLs FROM THE WIA COLLECTION

KEN MATCHETT VK3STL HON CURATOR WIA QSL COLLECTION
PO Box 1 SEVILLE 3139

The Marshall Islands — A Spoiled Paradise? (Part 2) K7LMU/HC8E

One cannot give an account of the story of amateur radio in the Marshalls without reference to the unfortunate episode relating to Ebon Atoll in the Marshalls. This "country" was added to the DXCC list in January 1966,

the QST of that month pointing out that confirmations would be accepted provided permission for the operation was given either by Ecuador or by the UN Trust Territory authorities. Ebon Atoll was never at any time part of Ecuador despite the fact that "permission" was given for amateur radio activity to Don Miller W9WNV and Charles ("Chuck") Swain K7KMU by the Consul of Ecuador in

Los Angeles. The explains the use of their K7LMU/HC8E call sign. At the time, there was great debate on the matter, the explanation being given that certain maps of the Pacific area incorrectly showed the atoll as being in Ecuadorian territory. After the mistake was realised, Ebon Atoll was deleted from the ARRL DXCC listing (as notified in the December 1966 issue of QST). Iris and Lloyd Colvin, under the Yasm Foundation, operated from Ebon in 1965 with the call KX6SZ/EBON, and from Majuro in the Marshalls as KX6SZ in 1965/66.

There has been some activity from the islands by other foreign DX-peditioners. It would

seem that their stations in the early 1980s were issued with the American prefix KX6, but with the suffix Z eg KX6ZX (on Majuro by PA0GMM) and KX6ZZ by DF7NM.

V73AZ

In late 1989 the prefix change of the Marshalls from KX6 to V73 took place. The suffixes of the call signs issued to former KX6 licensees bore no relation to their former calls, early operators having been issued with V73A calls. The local club on Kwajalein (formerly KX6BU) was issued with the call V73AX. The old prefix KX6 is currently being assigned to licensees in California. The V73AZ QSL shown here is the last of the V73A calls before the current issue of V73B calls. It was sent to top DXer, Mike VK6HD from members of the Roi-namur Radio Club on Kwajalein during last year's CQ SSB contest.

KX6BQ

This attractive multicoloured QSL emanates from the Amateur Radio Club station on Eniwetok, which has operated over a considerably long period. The picture shows an idyllic situation. Once described as the "Pearl of the Pacific" by Robert Louis Stevenson, the Marshalls today do not paint such a rosy picture. In 1980, agreement was reached between the Marshallese and US Governments whereby the islands would be self-governing in domestic and foreign affairs, the US retaining military rights. In 1983, a UN Special Commission reaffirmed that military bases should not prejudice self-determination and independence. Although most texts indicate self-government being attained in 1986, in fact it was not until December last year that the UN Security Council voted to terminate the US administered trusteeship. (The Commonwealth of the Northern Mariannas and the Federated States of Micronesia were two other Trust Territories similarly affected). Previously only the decision to grant self-government had been made. Despite its name of "Republic of the Marshall Islands", this young nation is frequently described as an "Associated State (with the United States)",

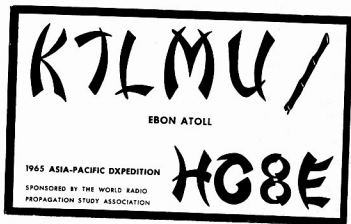
since so-called "Compacts of Association" have been made between the two governments, giving the US effective control of defence and the maintenance of the missile facility on Kwajalein.

There is little doubt that abnormalities amongst the native population have been caused by radioactive fallout and by contaminated coral dust. There is a real problem with plutonium-contaminated topsoil, much of which has been buried under tons of concrete slabs. The Nuclear Claims Tribunal has conducted several hearings and, in 1988, the US Congress agreed to settle all claims by paying \$US100 million into a trust fund for those affected, but court cases are still pending.

Having obtained self-government, the Marshallese find themselves in considerable financial difficulties. Copra, fish and handicrafts are exported, but hardly pay for the importation of Japanese cars and other luxuries. Tourism is just in its infancy and, despite having picturesque seascapes, beautiful lagoons and beaches, tourism cannot be compared with that of Guam and the Mariannas to which organised tours are arranged. (See "QSLs of the WIA Collection" AR April 1991).

Air services operate to the Marshalls from Fiji, Guam and Honolulu, but have not been developed on a tourist basis, and hotel accommodation offered is also very restricted. Rental paid by the US for the missile base brings in much needed funds. In fact, the country is virtually dependent upon the US for its financial survival. President Amata Kabua has recently advocated the use of an atoll or two as a rubbish disposal facility for the US mainland, his argument being that such a move would make the US partly dependent upon the new republic as well as bringing in much-needed US dollars.

There was talk at one stage last year of the possibility of allowing the US to use the Marshalls as an atomic waste disposal area but the proposal was bitterly opposed. Another problem is the increasing birth rate of the Marshallese. In 1988 the population stood at just over 43,000, and these were living (some in appalling conditions) on 181 sq km of land just above the high tide level of the Pacific Ocean. Any rise in temperature of the ocean due to the Greenhouse Effect would have catastrophic consequences. Adding to the problem in the Marshalls is the malnutrition



1990 CQ WW DX SSB CONTEST

MIN	CQs	Times/CQs
1.8	33	9 13
3.8	50	16 23
7.0	129	24 36
16	1269	37 53
21	1444	38 55
28	2141	34 84
Total	5084	155 317

Score 7,018,640

V73AZ

ROI-NAMUR RADIO CLUB
KWAJALEIN ATOLL, MARSHALL ISLANDS

V73AZ CFMS 2-WAY SSB QSO WITH:
VK6HD ON 10/27/90 RS 59
AT 0425 GMT ON 28 MHz

OPERATORS: V73BN, V73AT, V73AS
CLASS: MULTI-SINGLE

A WUPYQSL



of many of its inhabitants, diabetes being of great concern. As is the case of many a Pacific island, much of the problem lies with the importation of tinned food which has tended to replace the natural diet of fish and fresh fruit and vegetables. Is it yet another case of "Paradise Lost"?

Can YOU Help?

If you would like to play a part in building up the WIA QSL collection and to save something for the future, would you please send a half-dozen (more if you can spare them) QSLs which you feel would really help the collection along.

All cards are appreciated, but we especially

need commemorative QSLs, special event station QSLs, especially assigned call QSLs, pre-war QSLs, unusual prefixes, rare DX and pictorial QSLs of not so common countries. Could you help? Send to PO Box 1, Seville 3139, or phone (059) 64 3721 for card pick-up or consignment arrangements for larger quantities of cards. (Freight refunded).

Thanks

The WIA would like to thank the following for their kind contribution of QSL cards towards the collection (supplementary list):

Mike VK6HD (ex G3HDA)
Austin VK5WO
John VK3HW

Frank VK2QL
George VK3GI
Brian VK2MQ
Ron VK3QP
Terry VK2ALG
Herb VK3JO

Also, the family and friends of the following "Silent Keys" (supplementary list):
Max Muller VK3LU courtesy of Jeff VK3LU
Peter Fawcett VK3APF courtesy of Stan VK3BSR
Ron Higginbotham VK3RN
Ron Schmidt VK3LY courtesy of Milton VK3MN
Reg Sankey VK3XP

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CLUB CORNER

Moorabbin and District Radio Club

A Hamfest (lectures, sales, demonstrations, door prizes) will be held between 10am and 4.30pm Saturday 15 June at Cheltenham North Primary School, corner Bernard and Chester Roads, Cheltenham North. Refer Mewlows 77 J10. Admission charge \$2. VK3 members will find more details in an insert in this issue.

Darling Downs Radio Club

In October of this year, the Darling Downs Radio Club intends to have a practical day of experimenting.

Our intention is to send up a weather balloon with an antenna attached suitable for 160m experimental contact. We hope to make various contacts, changing the antenna from one-quarter wavelength through to at least one wavelength.

When these "field day" experiments are completed, it is our desire to launch the balloon with a beacon as a payload. At present we are collating all data and information (eg prevailing winds, height estimation of the balloon etc, etc) so that when the times comes we will be ready.

We will have to gain both CAA and RAAF permission, with possible approval from the meteorological people.

We will, of course, be in touch with our local airport authorities, since a relatively large number of light plane flights occur from the Toowoomba airport. We will be conducting these tests from a property at Hampton, some 32km road distance from Toowoomba.

THEO MÖLLER VK4ESK (HON PRES)

Brisbane North Radio Club

Following the AGM of this club earlier this month there were a few changes in office bearers.

Below, for your information, are the current club details.

Club Information

The club office bearers are as follows:
President, Paul Keating VK4BGT. Ph: 266 7936
Vice-Pres, Graham Clayton VK4BGC. Ph: 359 0109
Secretary, Bill Rahmann VK4BIL. Ph: 263 2630
Treasurer, Beverley Clayton. Ph: VK4NBC. Ph: 359 0109
Stn Manager, VK4WIN Ed Fisher VK4ABX. Ph: 357 6696
Asst Stn Managers VK4APZ
Library & Prop Officer, Col Hinxman VK4ACH. Ph: 356 9816
QSL Officer, Seb Calabro VK4FAX. Ph: 359 3529
Intruder Watch (IARUMS) David Brownsey. VK4AFA. Ph: (work) 835 8322
WICEN Rep, Geoff Adcock VK4AG. Ph: 359 7332
Education Officer, vacant
Awards Manager. Secretary carries out this task
Examinations Officer, Laurie Pritchard VK4BLE. Ph: 266 1454.

BILL RAHMAN VK4BIL
PO Box 78 CHERMSIDE 4032

Salvation Army Radio Operators' Fellowship

VK/ZL Chapter

Efforts are being made to re-establish SAROF in this region. With this in mind, the following steps have been/are being taken:

The callsign VK1SA has been taken out on behalf of SAROF, weekly nets are being established, from 1 May 1991, as below:

Tuesday 1000 hours UTC on 3.615MHz
Saturday 0600 hrs UTC on 14.300MHz +/- QRM

Future projects include:

A regular newsletter
A "special activity station" at the Salvation Army Training College, Sydney on Gala Day, 23 November 1991 using the SAROF callsign

VK1SA/2.

Membership is open to all Salvation Army soldiers who are licensed amateur radio operators.

KE THRELFALL VK1KT, 13 BUNDELA ST, NARRABUNDHA 2604.

Hervey Bay Amateur Radio Club

We wish to advise that the Hervey Bay Amateur Radio Club will be activating a special event station. The callsign VJ4HBW will be activated from 1 August 1991 to 31 August 1991. This will coincide with the Festival of Whales.

A guide to the frequencies is as follows: 3.790, 7.085, 14.226.5, 21.205, 28.495MHz, or as near as possible.

This annual festival celebrates the arrival of the humpback whales into the sheltered waters of Hervey Bay. During the next three months, these gentle giants of nature rest and rear their young, using the bay's warm waters as their personal playground, before continuing their migration south to the Antarctic region.

Visitors from many countries and all states of Australia travel here for this spectacular event.

An award and QSL will be available for working this special event station. Applications for the award may be directed to Box 829, Hervey Bay, Qld 4655.

73

JIM WHITE VK4JWW
PO Box 829 HERVEY BAY, 4655

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**Have you advised the
WIA Executive Office of
your new callsign?
Use the form on the
reverse of the Amateur
Radio address flysheet**

SILENT KEYS

DUE TO INCREASING SPACE DEMANDS OBITUARIES MUST BE NO LONGER THAN 200 WORDS

We regret to announce the recent passing of:

Mr R A Plater	L20717
Mr J B Koska	L30539
Mr Harry Caldecott	VK2DA
Mr Bill Kirk	VK4BWK
Mr M G Farmer	VK5GF
Mr R J Amos	VK5KRA
Mr Cyril Rutledge	VK6CR
Mr Clem Burt	VK7NBC

Bill Kirk VK4BWK

Bill Kirk passed away at the Homefield Aged Persons Homes, Mackay on Tuesday 16 April after an illness.

Born in New Zealand, he came to Australia in 1926 and, after working around the country, finally resided in Mackay in the early '40s. He gained his Radio Service Engineering Certificate from the Australian Radio College in November 1944. He was active mainly on 40 metres, with the callsign VK4AM. Just after the war, he ran a wireless service shop, until a fire and a flood forced him to change business.

His use of the hobby lapsed for a time, because of his heavy involvement as a gardener and in supporting the Uniting Church, especially at Homefield. Over the last eight years, he took up amateur radio again, and was able to operate from his unit at the homes under the callsign VK4BWK.

An ardent supporter of the Mackay Amateur Radio Club, Bill operated mainly on 2m FM, but loved CW sessions and SSB ragchews on 80 and 40 metres. An extremely conscientious and generous man, Bill will be missed by his friends.

CHARLES IVIN VK4DK
WIRELESS INSTITUTE

LIAISON OFFICER
MACKAY AMATEUR RADIO CLUB

Phyllis Mabel LeGrand VK4CPL

Phyllis (Phyl) passed away suddenly in Cairns on 14 February last. Members of the Cairns Amateur Radio & Electronics Club, their families and, indeed, the many radio amateurs who knew her, were shocked and profoundly saddened at the news of her passing.

Although born in England, Phyl spent her childhood and school years in Sydney. In October 1943 she and George LeGrand were married and, in the early 1950s, they came to Cairns to set up their home in the suburb of Earville. Over the years, Phyl selflessly gave

her support to various community and charitable bodies — she was a founder-member of the Earville branch of the QCWA, and was also well-known for the music programs she presented on the local community FM station, 4CCR.

Phyl joined the amateur radio ranks about 10 years ago, when she obtained her novice licence VK4NDG; she gained her full-call licence just three years ago. She served on the committee of the Cairns Amateur Radio Club as honorary treasurer for eight years and everyone, myself included, who had the good fortune to serve on the committee with her, would attest to her dedication and loyalty to the club. Phyl endeared herself to all through her generosity and perpetual good humour, and we in the club greatly miss her.

To George, son Brian and family, the president and members of the Cairns Amateur Radio & Electronics Club extend deepest sympathy.

KEN PYETT VK4MKP
PUBLICITY OFFICER
CAIRNS AMATEUR RADIO
& ELECTRONICS CLUB INC

Maxwell George Farmer VK5GF

Max died at the Alice Springs Hospital on 26 March 1991.

He was aged 74 years and was cremated at the Centennial Park Cemetery on 4 April 1991.

Several years ago, Max conducted a radio manufacturing business at North Terrace, Adelaide and, later, at Angus St, Adelaide. This provided mobile vehicle radios for commercial purposes.

His organisation also provided service facilities for these units for private users and the country emergency fire services. Ill health later on restricted his activities, which were conducted from his home premises.

He assisted all comers with their electrical difficulties and needs.

Max was also actively connected with the amateur radio movement for over 50 years in addition to his professional radio undertakings, and was always willing to assist amateur radio operators — myself among them.

This was very much appreciated by those concerned, and we regret his passing. His wife pre-deceased him, but a son and daughter remain.

Jeff VK8GF was able to journey to Adelaide from Alice Springs to attend the funeral service,

which was very well attended, indicating the respect with which Max was held by the community.

On behalf of all who were aided and assisted by Max, I extend our condolences to his family.

I acknowledge assistance in preparation of this by VK5FR Bill Franzi, who was associated with Max in some of his activities.

TOM LADLER VK5TL

Cyril Rutledge VK6CR

Cyril Rutledge was born on 10 January 1904 at Marmion St, East Fremantle, the son of John and Amy Rutledge (who was a great-granddaughter of Henry Trigg, who came to WA in 1829).

After serving his apprenticeship with Mr John Scurlock, he qualified in 1928, opening a pharmacy in Carnamah. In 1931 he moved to Dalwallinu, where he remained until 1944.

He had always been interested in radio since building his first crystal set. The were only two radio sets in Dalwallinu when he arrived there. During the Test series of the 1920s, he rigged up earphones so that the cricket enthusiasts could listen to the broadcasts. (He was given engraved cufflinks by the grateful listeners). During World War II he repaired radios for the district.

In 1944 he went to commercial radio 6IX as engineer, also doing relief work at Katanning and Merredin. However, he returned to pharmacy in 1945, retiring in 1972. It was in the late '70s that Cyril was encouraged to take up the position of Slow Morse Co-ordinator for the VK6 Division, a job he enjoyed and excelled at. This culminated in 1980 when he was voted "Amateur of the Year".

Cyril also displayed considerable talent in other areas, playing flute in the South Perth Philharmonic Orchestra. He also sang in the popular Commercial Travellers Choir.

Cyril was a true experimental amateur, showing great innovative talent when experimenting with various pieces of equipment.

After a period of hospitalisation, Cyril passed away on 11 March 1991. He is sadly missed by his family and friends.

Stanley Clement (Clem) Burt VK7NBC

Born 22 October 1917 — Died 16 March 1991.

A life-long interest in radio was, towards the end of his working life, translated into a novice licence. This modest achievement provided Clem with considerable enjoyment in his retirement and enabled him to enjoy many satisfying friendships via the airwaves.

R F BURTT

OVER TO YOU

ALL LETTERS FROM MEMBERS WILL BE CONSIDERED FOR PUBLICATION
BUT MUST BE LESS THAN 300 WORDS. THE WIA ACCEPTS
NO RESPONSIBILITY FOR OPINIONS EXPRESSED BY CORRESPONDENTS.

CB or Amateur?

Usually, in a democratic society, voting is used to decide major issues of the day. But those of us who were around when 27MHz was allocated to the CBRS, remember that no vote was taken on that subject. The weight of illegal operators forced the DoTC to allocate the 27MHz band to the CBRS. This was the only course of action the authorities could take.

Please consider (where have I seen that before?) the following:

DoTC statistical summary for March 1991 of radiocommunication stations licensed for operation in Australia and External Territories gives that there were:

- 19,392 amateurs, 418,551 CBers,
- 289 amateur repeaters, 377 CB repeaters
- 1. And we were worried about 28MHz intruders from the north of Australia?
- 2. Should we not target the CBers as a potential source of amateurs?
- 3. DoTC cannot supply a list of names and addresses of the CBers due to the Privacy Act.
- 4. What shall we (all amateurs) do?
- 5. Nothing?

NEIL PENFOLD VK6NE
2 Moss CRT
KINGSLEY 6026

(I wrote this month's editorial before reading your letter, Neil. We seem to agree rather well! Ed).

Thin End of the Wedge?

It has suddenly become not "Use it or lose it", but "populate or perish" on 10 metres. I had the misfortune to intercept blatant CB activity on 27/4/91 at 0706 on 28.500MHz. It was conspicuous because it was LSB with usual short bursts of music and jargon between three stations.

This unfortunately coincides with the promotion of eg the HR2510. I understand DSE has sold the lot. My DSE agent nearby asked no questions about licence or end use at the time I purchased my HR2510. In fact, examination of the Bankcard slip back at QTH revealed that he had in fact booked it out as — you guessed it — CB radio!

Congratulations to Union for page 17 and 18 of the HR2510 handbook. The company is sure trying to prevent piracy by providing copious warnings and WIA information. When will our polities and DoC make it mandatory to produce a licence before purchase of transmitting apparatus is allowed?

It's on fellers. Forget the Asian invasion. Remember the 27MHz saga? And its ultimate amateur bereavement?

As a footnote, 25W irrigation transmitting sensors are available through a firm in Gee-Long which claims DoC has allocated it 29.1MHz. I thought 28 to 30MHz was exclusive amateur service! Ah well!

MAX STARK VK2CMS
Box 89
KORALEIGH 2735

(Actually 28 to 29.7MHz, Max, but makes no difference. Ed)

Pirate Problem?

Having been QRT for about 10 years has apparently allowed someone to misrepresent my call sign, as evidenced by a number of QSL cards received ex-Bureau this day. The cards report two-way SSB communications on 7, 14 and 21MHz from February 1988 through December 1989 between VK5HP (no operator name cited) and various European stations.

Licensed in 1975, I have NEVER made a voice transmission on any amateur band, as I work HF CW exclusively. (And QRP at that! Ed).

Perhaps this is the new game in town??? On a lighter note, I wish to publicly acknowledge the fraternal support extended me by the members of the Whyalla Amateur Radio Club, Peter Baker of Whycom, Andrew VK5AAQ and, more recently, Neville VK5XD and Bernie VK5ABS of the South Coast Amateur Radio Club, for assisting me in returning to the greatest hobby of them all. Thank you.

"DOC" WESCOMBE-DOWN VK5HP
C/- WHYALLA ARC
PO Box 444
WHYALLA 5600

Novice Anomaly

The Department of Transport and Communication brochure DOCT71, revised in July 1990, on page 7, indicates that:

37. The licensee of an amateur station (novice) shall only use the following emission modes:

- (a) when operating on bands below 30MHz: 200H1A1, 8K00A3E, 4K00H3E, 4K00A3E, 8K00B8E/B8W and 4K00J3E*

The above emissions are clarified in another DoTC brochure, DOCT72, also revised in July 1990, and generally mean

- 200H1A1 — CW
- 8K00A3E — AM
- 4K00H3E — SSB full carrier
- 4K00H3E — SSB reduced carrier
- 8K00B8E/B8W — ISB, independent side band with two or more analogue channels, supporting any combination of telegraphy, telephony, fax, data and TV

4K00J3E — AAB suppressed carrier

The mode 8K00B8E/B8W is rather surprising. Has DoTC conferred on novices a full range of multiplexed packet, RTTY, voice and TV modes on bands below 30MHz?

Or are we asked to spot the deliberate mistake in the publication?

WILL SCOTT VK4XP
PO Box 826
GLADSTONE 4680

Standards

Before somebody takes me to task over my letter in May issue I assure them all that I do know the difference between a 'bit' and a 'byte'.

There are eight bits to a byte, and my letter set out to stir by suggesting that 20mb is "a very difficult concept to understand at two-and-a-half thousandths of a 'bit'", which lost something in editorial translation, the point being that a small case 'm' is a divisor. At eight bits to the byte, of course, there must be only 2M5 bits in 20mb, must there not? I apologise for being too subtle.

Thank you for the statement "small k for kilo is standard" and the inference that capital M for Mega is standard which, together with the 20mb problem, amply proves my original point that our standards need to be standard. Just because something is, does not make it right.

PETER HUGHES VK6HU
58 PRESTON ST
COMO 6152

Handbook Success

I noted that you mentioned the *Novice Operator's Theory Handbook* in your editorial in the April issue of AR.

I'd like you to know that we published it in about 1980-81 and have sold over 9000 copies so far. So we consider it highly successful, as the Australian market is not exactly a large one.

We had no joy with WIA-affiliated organisations overseas so far as interest in sales was concerned so we concentrated on the local market and it has been pretty good, with many testimonials from newly licensed amateurs calling or writing letters of thanks for the book having helped them "to get there".

The significant thing is that it is the first, and we think the best, theory book written for the local novice licence candidate in this country.

Our stocks are now running low, so are planning a new and updated edition, so any reader's comments and suggestions would be welcome at this time.

I'd be grateful if you would print this letter and thus possibly inspire some reaction from the readers out there in WIA-Land!

By the way, I'm proud to be a member and supporter of the WIA as I have been a member for quite some years now and I strongly believe in being an active member.

I enjoyed my stint as Federal Education

Co-ordinator, and the links with the DoTC and with delegates at the annual conference were invaluable, I believe, in learning more about the issues and how the democratic process works in the WIA.

All the best, and good wishes; thanks for a great magazine. I always read it through once it arrives, and it certainly helps me to take up with what's going on in VK-Land.

GRAEME SCOTT VK2KE (EX VK3ZR)
635 EDMONDSON AVE
ALBURY 2640

Value of IRCs

Regarding Phill Hardstaff's comments about IRCs I agree that there is a lack of knowledge concerning the latest instructions as to the amount to be given when they are redeemed. Following the first article, I took two IRCs to my local post office (an unofficial one) and the Postmistress stated she could give me only 85 cents, that is the surface rate for an overseas letter. I showed her the article and she then rang her controlling post office, Queen Victoria Terrace, which also advised 85 cents. She quoted the article to them and, following further investigations, they advised that the correct amount was \$1, and that the \$1.20 you received was wrong. However, they promised to look further into the matter.

Last week I was again in my suburban post office, and the Postmistress said that further investigations had proved that \$1.20 was the correct amount. She showed me the relevant section in their instruction book and it was very clear that the redemption rate is the actual surface rate for Zone 5.

Should anybody have any problems with their post office, they should quote Section 10.23 of the regulations.

FRANK MACKLIN VK1ZL
1 MACARTNEY CRES
DEAKIN ACT 2600

AR and ARA

Ray Jones has submitted a package of common sense (May '91) when he advocates the pooling of our resources with Syme Media Pty Ltd and becoming a vital part of that company's highly successful *Amateur Radio Action*.

I refer readers to Fact 3 in his three-point plan.

The WIA "establishment" will probably ignore, possibly hate, this amalgamation, which is full of merit.

But, instead of sweeping it under the carpet without any proper open and frank discussion, let us read it sensibly and objectively, unlike the AR editor's comments to Ray Jones ... "Shall we burn him at the stake?" in the May issue. Most improper, with little regard to Australia's free press.

It's obvious *Amateur Radio Action* is a goer, packed with advertisements, product reviews, DX from a world leader, Jim Smith VK9NS, and pages upon pages of tidbits that assure it

of a bumper circulation month by month.

The spinoffs to the WIA through such a move would be tremendous.

Costs would be cut dramatically, and our message would go to a far greater number than today.

If we want to get the novices of today into our fold, then now is the time to open our doors through doing a deal with the Syme Organisation.

Let others comment on Ray Jones' suggestions before you, Mr Editor, "light the fire".

ROTH JONES VK3BG
23 CHERRY TREE GROVE
CROYDON 3136

(The comment was intended to be humorous, Roth, in view of Ray's use of the word "heresy". Ed)

Fortress CW

I feel compelled to reply to VK2PA's volley from the parapet of Fortress CW, in AR/OTY for May.

My letter in April OTY was not an attack on CW, so please stop defending CW — for those who enjoy CW, I wish them many happy hours "pounding brass".

The days when CW was essential to the enjoyment of amateur radio are gone — that is, essential not in terms of qualifications, but in terms of the alternatives available now to CW illiterates.

There are many topics vying for the attention of the radio amateur, however, people

have only limited time (and money) to indulge their interest, and they choose carefully.

Many decide against CW, particularly those who do not take easily to the subject — they are not interested in slogging away at something they do not find enjoyable, when there are so many alternatives.

CW is under attack, not from an "Anti-CW Lobby", but a far more dangerous adversary — "disinterest", and, as a result, many amateurs turn their backs on a large part of the spectrum.

The "compulsory CW" routine is no longer going to bring in the numbers, and that's your problem.

I am not sorry if my April letter made you sick, Peter; what upset me is that you will not even consider modification of the CW requirements for handicapped people "despite what our personal compassionate thoughts may be" (your words, OTY Feb).

I have a great admiration for the achievements of the physically handicapped, and believe strongly that they should be given special consideration, wherever appropriate.

I wonder what the Public Advocate, the many organisations devoted to the welfare of handicapped people, and other radio amateurs, would say about your advice to VK5KIR (Feb OTY), "Stick with it, Ian, you only have 5wpm to go."

GRAHAM B JACKSON VK3TFN
PO Box 39
UPPER BEACONSFIELD 3808

Morseword No 51

	1	2	3	4	5	6	7	8	9	10	
1											Across
2											1 Sausage
3											2 Prison
4											3 Irritate
5											4 Strip
6											5 Small animal
7											6 Endure
8											7 Whole
9											8 Lid
10											9 Stated
											10 Mature
											Down
											1 Parched
											2 Communication
											3 Fibbed
											4 Baby's protector
											5 Successor
											6 Move swiftly
											7 Beginning
											8 Filth
											9 Not here
											10 Urn

Audrey Ryan © 1990
Solution Page 56

Inadvertent Error

In my letter "Code Not Only Problem" in April, I felt that the word "not" was missing in one spot. Tracking back, it turns out that it WAS missing in my original; that not editor, nor keyboard operator, nor proofreader had a role in the word being missing.

The sixth part should have read:

"Ten words per minute Morse is NOT very likely, even after a year or two practice — say 20 minutes a session — at taking down 10wpm, to trim this K call back to a full call, even with frequent examination during that time."

Yes, there was another oversight, too.

My apologies to all involved in publication, and to any who wondered what was being got at when reading it.

IAN CROMPTON VK5KIC
9 CRAIG ST
RICHMOND 5033

Need for Code?

Letters are frequently published either supporting or opposing the retention of the requirement for an ability to send and receive Morse at certain speeds in order to qualify for certain amateur licences. Usually opposition is construed as being to the mode itself, which is often not the case. There are many advantages in being able to use Morse, and many reasons why amateurs should learn it, but no reason why it should be a licence condition, any more than skill in typing, although highly desirable when using keyboard modes, is a licence condition.

In the early days of radio, a knowledge of Morse was essential, as it was the only mode by which communication was possible, but now it is but one of many, and yet it is still singled out as the one in which licensees must qualify. There appears to be no point to this if

the candidates have no intention of using it after qualification. Equally, operators who have otherwise qualified should not be denied access to certain frequency bands simply because they lack that knowledge. Competence in Morse is no measure of an amateur's overall ability.

At the present state of the art, continued insistence on this licence condition can only be regarded as both repressive and retrogressive, and therefore a deterrent to the population and preservation of our bands.

As a former commercial operator, I have no personal problem with Morse, but I have always opposed the existence of unjustified restrictive practices. This licence requirement appears to be such a practice.

S V ELLIS VK2DDL
82 TAREE ST
TUNCURRY 2428

ALARA

JENNY ADAMS VK3MDR
70 KANGAROO GROUND RD WATTLE GLEN 3096

Greetings to all,

It is amazing what information people keep for any one of a hundred reasons. Within a week of the arrival of the April AR, Marilyn VK3DMS received a letter from Rod Torrington VK3TJ. Rod still had his 1938 callbook, and looked up the listing, which in those gracious days listed everyone as Mr, Miss or Mrs. (Oh, for some of that today). So, thanks to Rod, we have the following list:

- * 1. VK2GA McKenzie, Mrs F V, 26 George St, Greenwich Point
- * 2. VK2YG Litchfield, Miss L N, 4 Yeo St, Ashfield
- * 3. VK3HM Hutchings, Mrs E L, "Bryn Avon", Callawadda
- * 4. VK3HQ Hutchings, Miss M L, "Bryn

Avon", Callawadda

- * 5. VK3YL Marshall, Miss M A, 650 Dandenong Rd Murrumbene
- * 6. VK4JH Humphry, Mrs I J L, Poopoonbah via Giru
- * 7. VK4LO Nolan, Mrs V E, 110 Wharf St, Brisbane
- * 8. VK4YL MacKenzie, Miss F M, Fire Station, Wynnum
- * 9. VK5YL Geisel, Miss B A, Charles St, Murray Bridge
- * 10. VK6JC Chinery, Miss J C, John St, Welshpool
- * 11. VK6MH Hill, Mrs M L, 33 Trenton St, Wiluna
- * 12. VK6YL Longley, Miss R V, 7 Cathbert St, Shenton Park

13. VK7YL Crowder, Miss J I, 88 Main Rd, Lower Sandy Bay

The names marked with an * we DO have information on already. So, to all holders of objects that may be useful one day (people after my own father's heart, and much to my mother's horror) we will continue to appreciate your efforts in our history hunt of women amateur radio operators of the past. It is interesting to note that VK5YL is recognised in the Adelaide Telecom Museum.

At the Easter WICEN exercise (the Mildura Caltex Ski 100) there were three ALARA members involved — Marilyn VK3DMS who is Region N Co-ordinator, VK3BJB and Marlene VK3JAW! Since these are the only three ALARA members in Mildura, this is quite a good effort.

Remember our Monday night nets. It is really nice to hear new voices on the air.

73/33

Preparation for Warc-92 (Continued From Page 24)

Membership of Delegation

As a member of the Australian delegation, David Wardlaw was able to participate in discussions between the Australian, US, Japanese and UK delegations. There was close co-operation and a free exchange of ideas and information between Australia and New Zealand.

Participation in the JIWP was a very important factor in the lead-up to participation in WARC-92.

Role of the IARU

The work of the IARU in making submissions to and being represented at the meetings of IWP 8/14, IWP 8/15 and JIWP 10, 6, 3, 8/1 paid off in that the references to the amateur services from these meetings which made up part of the draft report of JIWP WARC-92 were able to be maintained in the final report.

It is to the benefit of the amateur service that there is a dedicated group of amateurs within the IARU and various administrations who are able to contribute in this area.

Why Did the WIA Participate in the JIWP WARC-92 Meeting?

The answer to this is contained in the substance of the JIWP WARC-92 report which answered a number of questions put about the amateur service, its operational and technical characteristics, and frequency requirements. It was essential that the final text in the JIWP report covering these questions which were put about the amateur service truly mirrored the functions and requirements of the service.

The importance of CCIR preparation for ITU conferences was highlighted in WARC-79, where the report of the CCIR Special Preparatory Meeting (SPM) held in 1978 contained a suggestion of the need for an increase in the amateur family of frequency and on HF, and also for the amateur satellite service.

These suggestions were taken up at the WARC, resulting in the allocation of the new HF and satellite bands.

If the SPM report had not contained favour-

able comment on these issues then the amateur service would have had a much more difficult task to get them through the main conference.

WIA participation in the SPM in 1978 helped to have the essentials of an Australian input document (produced by DOC and the WIA) included in the report of the SPM to WARC-79.

Thus, to get a reasonable hearing, the amateur service needs actual representation at a national delegation level as well as a presence by the IARU itself.

As the WARC in 1992 is only a limited allocation WARC and has no scope for the expansion of amateur bands, the WIA has had to take a defensive position on behalf of the amateur service, making sure that the output of the JIWP did not make things hard for the amateur service at next year's WARC.

Australia was one of only three countries with a member of their delegation to JIWP WARC-92 primarily representing the amateur service.

HF PREDICITONS

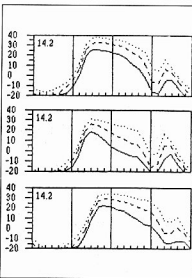
ROGER HARRISON VK2ZTB
THE APOGEE GROUP

Listings now directly in signal strength

The charts now provide predictions **directly** in **signal strength** (which you can relate to S-points), a much more usable and understandable form. The charts are otherwise exactly the same format, and based on the same parameters as I have used previously.

The base reference signal strength is 1 μ V in 50 Ohms, which is between S3 and S4, if your S-meter is calibrated to this standard, where S9 is 50 μ V, and the lowest detectable signal 0.1 μ V (see Ref.1). The table below relates μ V, S-points and dB(uV) based on this standard.

μ V in		
50 Ohms	S-points(6 dB)	dB(uV)
50.00	S9	34
25.00	S8	28
12.50	S7	22
6.25	S6	16
3.12	S5	10
1.56	S4	4
0.78	S3	-2
0.39	S2	-8



0.2 S1 -14. An entirely new prediction program has been developed in conjunction with colleague Jack Middlehurst, based on the methods developed by T Damboldt and P Suessman and used in their program MINIFT4, which I was using to generate the previous charts. This new program has been written in the C language and is called **Graph-DX**. It features a friendly, easy-to-operate 'user interface', based on a series of menu screens, and a variety of output graphs and tables which can all be displayed on-screen (EGA, Hercules or VGA) as well as output to a variety of printer types. What you see on the screen is what you get on the printer (WYSIWYG propagation predictions!) Output graphs can be presented directly in terms of **signal strength at the receiver** - either dB relative to 1 mW (dBm), or dB relative to 1 μ V, in 50 Ohms. Output in dB re 1 μ V/metre field strength, is retained, too. Sales and technical enquiries on Graph-DX may be addressed to: FT Promotions, PO Box 285, Balmain NSW 2041. There being a special DXpedition to Baring Is in July, the accompanying graphs, from Graph-DX, for 14 MHz provide a good idea of times you might try to get through. Ref 1. *Signal Strength, "S" Meters and Preamps*, Gordon McDonald VK2ZAB, AR, July 1990, p14.

UTC	MUF	dBu	FOT	14.2	18.1	21.2	24.9	28.5
1 20.6	8	15.6	...	...	...	...	...	...
2 20.5	8	15.4	...	...	...	...	...	...
3 22.7	1	16.9	...	...	...	...	...	...
4 25.6	2	19.3	...	...	...	...	...	...
5 26.8	3	21.9	...	...	...	...	...	...
6 28.4	3	22.6	...	...	...	...	...	...
7 28.7	2	21.1	...	...	...	...	...	...
8 29.5	2	18.4	...	...	...	...	...	...
9 30.1	2	16.0	...	...	...	...	...	...
10 31.1	1	13.8	...	...	...	...	...	...
11 32.5	1	11.6	...	...	...	...	...	...
12 33.9	7	10.4	...	...	...	...	...	...
14 12.9	13	9.7	...	...	...	...	...	...
15 12.6	20	9.6	...	...	...	...	...	...
16 12.4	25	9.4	...	...	...	...	...	...
17 12.4	27	9.4	...	...	...	...	...	...
18 11.1	30	8.5	...	...	...	...	...	...
19 9.6	32	7.5	...	...	...	...	...	...
20 9.3	32	7.2	...	...	...	...	...	...
21 13.2	29	9	...	...	...	...	...	...
22 20.6	21	15.9	...	...	...	...	...	...
23 19.2	20	14.7	...	...	...	...	...	...
24 21.8	15	16.7	...	...	...	...	...	...

UTC	MUF	dBu	FOT	14.2	18.1	21.2	24.9	28.5
1 20.8	14	15.8	...	...	...	...	...	...
2 20.5	7	15.4	...	...	...	...	...	...
3 22.8	4	17.0	...	...	...	...	...	...
4 25.9	4	19.7	...	...	...	...	...	...
5 27.7	4	21.4	...	...	...	...	...	...
6 28.3	3	19.8	...	...	...	...	...	...
7 28.9	4	22.9	...	...	...	...	...	...
8 29.8	3	22.4	...	...	...	...	...	...
9 29.6	3	19.8	...	...	...	...	...	...
10 27.1	3	16.8	...	...	...	...	...	...
11 27.1	3	15.4	...	...	...	...	...	...
12 27.1	3	10.6	...	...	...	...	...	...
13 10.0	6	7.4	...	...	...	...	...	...
14 10.0	6	6.9	...	...	...	...	...	...
15 9.4	25	7.1	...	...	...	...	...	...
16 9.7	27	7.5	...	...	...	...	...	...
17 10.2	27	7.5	...	...	...	...	...	...
18 10.6	29	8.0	...	...	...	...	...	...
19 9.6	31	7.5	...	...	...	...	...	...
20 9.1	31	6.9	...	...	...	...	...	...
21 8.9	31	6.9	...	...	...	...	...	...
22 11.8	29	9.2	...	...	...	...	...	...
23 15.0	26	11.6	...	...	...	...	...	...
24 19.7	19	14.9	...	...	...	...	...	...

UTC	MUF	dBu	FOT	14.2	18.1	21.2	24.9	28.5
1 19.2	19	14.6	...	...	...	...	...	...
2 18.9	10	14.3	...	...	...	...	...	...
3 21.5	5	12.7	...	...	...	...	...	...
4 23.4	4	18.0	...	...	...	...	...	...
5 25.8	4	19.6	...	...	...	...	...	...
6 26.0	4	21.0	...	...	...	...	...	...
7 26.3	4	21.0	...	...	...	...	...	...
8 27.6	4	22.4	...	...	...	...	...	...
9 27.6	3	20.9	...	...	...	...	...	...
10 26.0	3	18.4	...	...	...	...	...	...
11 21.5	4	16.2	...	...	...	...	...	...
12 18.1	5	15.7	...	...	...	...	...	...
13 15.0	11	8.3	...	...	...	...	...	...
14 12.8	10	9.8	...	...	...	...	...	...
15 11.1	17	8.3	...	...	...	...	...	...
16 10.4	24	7.9	...	...	...	...	...	...
17 10.4	26	9	...	...	...	...	...	...
18 10.5	28	7.9	...	...	...	...	...	...
19 10.8	28	8.1	...	...	...	...	...	...
20 9.9	30	7.4	...	...	...	...	...	...
21 8.6	31	6.6	...	...	...	...	...	...
22 8.4	31	6.5	...	...	...	...	...	...
23 17.2	26	16.8	...	...	...	...	...	...
24 17.5	23	15.4	...	...	...	...	...	...

VK EAST - MEDITERRANEAN

UTC	MUF	dBu	FOT	14.2	18.1	21.2	24.9	28.5
1 18.2	13	12.6	...	...	...	...	...	...
2 17.4	17	12.1	...	...	...	...	...	...
3 17.5	23	11.7	...	...	...	...	...	...
4 16.5	23	11.5	...	...	...	...	...	...
5 16.3	24	11.5	...	...	...	...	...	...
6 16.5	23	11.8	...	...	...	...	...	...
7 16.7	22	12.6	...	...	...	...	...	...
8 16.8	14	13.1	...	...	...	...	...	...
9 13.5	...	...	...	...	...	...	...	...
10 9.7	...	...	...	...	...	...	...	...
11 9.9	...	...	...	...	...	...	...	...
12 9.5	...	...	...	...	...	...	...	...
13 9.7	...	...	...	...	...	...	...	...
14 9.4	...	...	...	...	...	...	...	...
15 10.2	...	...	...	...	...	...	...	...
16 9.4	...	...	...	...	...	...	...	...
17 8.8	...	...	...	...	...	...	...	...
18 8.6	...	...	...	...	...	...	...	...
19 11.2	...	...	...	...	...	...	...	...
20 16.2	...	...	...	...	...	...	...	...
21 21.4	...	...	...	...	...	...	...	...
22 21.0	...	...	...	...	...	...	...	...
23 21.0	...	...	...	...	...	...	...	...
24 20.4	...	...	...	...	...	...	...	...

VK STH - MEDITERRANEAN

UTC	MUF	dBu	FOT	14.2	18.1	21.2	24.9	28.5
1 18.2	13	12.6	...	...	...	...	...	...
2 17.4	17	12.1	...	...	...	...	...	...
3 17.5	23	11.7	...	...	...	...	...	...
4 16.5	23	11.5	...	...	...	...	...	...
5 16.3	24	11.5	...	...	...	...	...	...
6 16.5	23	11.8	...	...	...	...	...	...
7 16.7	22	12.6	...	...	...	...	...	...
8 16.8	14	13.1	...	...	...	...	...	...
9 13.5	...	...	...	...	...	...	...	...
10 9.7	...	...	...	...	...	...	...	...
11 9.9	...	...	...	...	...	...	...	...
12 9.5	...	...	...	...	...	...	...	...
13 9.7	...	...	...	...	...	...	...	...
14 9.4	...	...	...	...	...	...	...	...
15 10.2	...	...	...	...	...	...	...	...
16 9.4	...	...	...	...	...	...	...	...
17 8.8	...	...	...	...	...	...	...	...
18 8.6	...	...	...	...	...	...	...	...
19 11.2	...	...	...	...	...	...	...	...
20 16.2	...	...	...	...	...	...	...	...
21 21.4	...	...	...	...	...	...	...	...
22 21.0	...	...	...	...	...	...	...	...
23 21.0	...	...	...	...	...	...	...	...
24 20.4	...	...	...	...	...	...	...	...

VK WEST - MEDITERRANEAN

UTC	MUF	dBu	FOT	14.2	18.1	21.2	24.9	28.5
1 17.5	13	12.2	...	...	...	...	...	...
2 16.7	16	11.7	...	...	...	...	...	...
3 16.1	2	11.4	...	...	...	...	...	...
4 15.5	2	11.3	...	...	...	...	...	...
5 15.7	13	11.3	...	...	...	...	...	...
6 16.0	14	11.3	...	...	...	...	...	...
7 16.7	13	11.3	...	...	...	...	...	...
8 16.2	13	11.2	...	...	...	...	...	...
9 16.8	10	15.5	...	...	...	...	...	...
10 16.6	3	12.9	...	...	...	...	...	...
11 13.3	...	...	...	...	...	...	...	...
12 11.1	...	...	...	...	...	...	...	...
13 9.7	...	...	...	...	...	...	...	...
14 9.4	...	...	...	...	...	...	...	...
15 9.5	...	...	...	...	...	...	...	...
16 9.8	...	...	...	...	...	...	...	...
17 10.1	...	...	...	...	...	...	...	...
18 9.6	...	...	...	...	...	...	...	...
19 10.4	...	...	...	...	...	...	...	...
20 10.4	...	...	...	...	...	...	...	...
21 10.4	...	...	...	...	...	...	...	...
22 14.3	...	...	...	...	...	...	...	...
23 18.6	...	...	...	...	...	...	...	...
24 18.1	...	...	...	...	...	...	...	...

VK EAST - EUROPE L.P.

UTC	MUF	dBu	FOT	14.2	18.1	21.2	24.9	28.5
1 18.2	13	12.6	...	...	...	...	...	...
2 17.4	17	12.1	...	...	...	...	...	...
3 17.5	23	11.7	...	...	...	...	...	...
4 16.5	23	11.5	...	...	...	...	...	...
5 16.3	24	11.5	...	...	...	...	...	...
6 16.5	23	11.8	...	...	...	...	...	...
7 16.7	22	12.6	...	...	...	...	...	...
8 16.8	14	13.1	...	...	...	...	...	...
9 13.5	...	...	...	...	...	...	...	...
10 9.7	...	...	...	...	...	...	...	...
11 9.9	...	...	...	...	...	...	...	...
12 9.5	...	...	...	...	...	...	...	...
13 9.7	...	...	...	...	...	...	...	...
14 9.4	...	...	...	...	...	...	...	...
15 10.2	...	...	...	...	...	...	...	...
16 9.4	...	...	...	...	...	...	...	...
17 8.8	...	...	...	...	...	...	...	...
18 8.6	...	...	...	...	...	...	...	...
19 11.2	...	...	...	...	...	...	...	...
20 16.2	...	...	...	...	...	...	...	...
21 21.4	...	...	...	...	...	...	...	...
22 21.0	...	...	...	...	...	...	...	...
23 21.0	...	...	...	...	...	...	...	...
24 20.4	...	...	...	...	...	...	...	...

VK STH - EUROPE L.P.

UTC	MUF	dBu	FOT	14.2	18.1	21.2	24.9	28.5
1 18.2	13	12.6	...	...	...	...	...	...

UTC	MUF	dBd	FOT	14.2	18.1	21.2	24.9	28.5	UTC	MUF	dBd	FOT	14.2	18.1	21.2	24.9	28.5	UTC	MUF	dBd	FOT	14.2	18.1	21.2	24.9	28.5
1	1.5	1	1	1	1	1	1	1	1	1.5	1	1	1	1	1	1	1	1	1.5	1	1	1	1	1	1	1
2	2.7	-4	7.4	2	-7	-19	-39	...	2	9.8	18	7.5	5	-10	-27	...	...	2	8.4	13	6.5	3	-21	...	...	...
3	9.5	-13	7.2	1	0	-8	-4	-18	3	15.7	11	10.1	11	5	-3	-17	-34	3	13.9	12	10.4	12	6	-10	-29	...
4	13.4	4	10.4	1	1	1	1	1	4	18.1	11	11.4	11	13	12	7	...	4	15.9	12	10.4	12	6	-10	-29	...
5	21.4	4	10.4	1	1	1	1	1	5	29.5	8	22.7	1	11	13	12	...	5	29.5	8	22.5	5	1	11	14	13
6	28.9	5	22.5	-13	3	7	8	4	6	31.1	7	25.1	-4	9	11	12	10	6	32.2	6	24.6	-5	8	12	13	11
7	27.4	5	22.5	-11	5	6	6	4	7	29.5	7	25.5	-1	9	11	12	9	7	31.6	6	24.6	-7	6	10	11	8
8	24.5	6	15.3	0	5	6	6	1	8	23.7	8	18.8	6	8	10	6	0	9	27.7	7	20.7	-4	8	10	9	6
9	20.6	6	12.4	3	5	2	-6	-17	10	20.2	8	15.8	6	8	7	7	-20	10	24.5	8	18.4	2	10	11	8	2
10	15.3	6	9.9	5	5	1	-10	-30	11	16.7	7	13.0	8	9	-8	11	...	11	20.9	7	15.7	8	12	9	3	-6
12	10.9	5	8.1	5	6	-3	-15	-34	12	13.4	10	10.4	10	3	-7	-22	...	12	16.7	12	12.5	12	10	4	-6	-20
13	9.4	9	7.0	5	5	-10	-27	...	13	11.4	12	8.8	9	-3	-17	-38	...	13	13.3	16	9.9	15	5	-6	-23	...
14	8.9	9	7.0	5	5	-10	-27	...	14	10.3	13	7.9	8	-9	-28	11	...	14	10.9	15	10.7	15	5	-6	-23	...
15	8.6	9	7.0	5	5	-10	-27	...	15	10.1	16	7.8	10	-11	-31	...	...	15	9.4	26	7.0	9	14	-36	...	...
16	8.2	9	7.0	5	5	-10	-27	...	16	10.3	26	7.8	12	-10	-31	...	...	16	8.9	31	6.8	9	19	-36	...	...
17	8.5	51	7.3	11	-11	-35	...	...	17	10.6	32	7.5	12	-11	-33	...	...	17	8.6	33	6.7	9	19	-36	...	...
18	9.2	33	15.9	9	-16	-31	...	...	18	9.9	32	7.5	12	-11	-33	...	...	18	9.4	35	6.5	9	19	-36	...	...
19	9.5	34	16.4	4	-23	...	...	...	19	9.7	32	7.5	12	-11	-33	...	...	19	8.8	35	6.5	9	19	-36	...	...
20	8.3	34	16.4	4	-23	...	...	...	20	9.1	32	7.5	12	-11	-33	...	...	20	8.1	35	6.7	9	19	-36	...	...
21	9.8	32	5	5	7	-17	...	...	21	8.6	32	7.0	12	-11	-35	...	...	21	8.5	35	6.5	4	-25	...	...	...
22	9.1	30	7.0	2	-21	...	...	...	22	9.7	30	7.0	12	-11	-35	...	...	22	8.4	35	6.5	4	-25	...	...	...
23	8.2	19	6.5	2	-21	...	...	...	23	9.0	30	7.0	12	-11	-35	...	...	23	8.4	34	7.1	11	-14	-37	...	...
24	8.2	7	6.5	0	-20	...	...	...	24	8.6	34	6.9	5	-19	...	...	...	24	8.5	34	6.5	5	-22	...	...	...

VK EAST - AFRICA VK STH - AFRICA VK WEST - AFRICA

UTC	MUF	dBd	FOT	14.2	18.1	21.2	24.9	28.5	UTC	MUF	dBd	FOT	14.2	18.1	21.2	24.9	28.5	UTC	MUF	dBd	FOT	14.2	18.1	21.2	24.9	28.5
1	31.1	12	25.2	-3	11	15	16	15	1	27.5	10	22.0	-5	8	12	12	9	1	32.5	11	25.0	3	15	18	15	15
2	31.1	11	25.2	-3	11	15	16	14	2	26.5	10	22.0	-5	8	12	12	7	2	32.5	11	25.0	3	15	18	15	15
3	29.3	11	23.9	-5	9	14	14	12	3	25.8	9	20.2	-9	6	10	10	8	3	29.3	11	23.9	4	10	15	15	12
4	29.3	11	23.9	-5	9	14	14	12	4	26.7	9	22.2	-9	6	10	10	8	4	29.3	12	23.9	5	9	14	14	12
5	26.9	12	24.0	-2	11	15	15	13	5	26.7	9	22.2	-9	6	10	10	8	5	26.9	12	23.9	5	9	14	14	12
6	28.9	11	22.1	11	19	19	17	12	6	27.6	9	20.1	-1	14	14	11	6	6	28.9	12	23.9	5	9	14	14	12
7	26.9	14	20.1	23	24	22	17	9	7	26.9	11	18.0	17	18	18	9	...	7	29.7	12	23.8	10	10	19	17	13
8	26.9	14	20.1	23	24	22	17	9	8	26.9	11	18.0	17	18	18	9	-12	8	29.7	12	23.8	10	10	19	17	13
9	26.9	14	20.1	23	24	22	17	9	9	26.9	11	18.0	17	18	18	9	...	9	26.9	12	23.8	10	10	19	17	13
10	26.9	14	20.1	23	24	22	17	9	10	26.9	11	18.0	17	18	18	9	-18	10	26.9	12	23.8	10	10	19	17	13
11	26.9	14	20.1	23	24	22	17	9	11	26.9	11	18.0	17	18	18	9	...	11	26.9	12	23.8	10	10	19	17	13
12	26.9	14	20.1	23	24	22	17	9	12	26.9	11	18.0	17	18	18	9	...	12	26.9	12	23.8	10	10	19	17	13
13	26.9	14	20.1	23	24	22	17	9	13	26.9	11	18.0	17	18	18	9	...	13	26.9	12	23.8	10	10	19	17	13
14	26.9	14	20.1	23	24	22	17	9	14	26.9	11	18.0	17	18	18	9	...	14	26.9	12	23.8	10	10	19	17	13
15	26.9	14	20.1	23	24	22	17	9	15	26.9	11	18.0	17	18	18	9	...	15	26.9	12	23.8	10	10	19	17	13
16	26.9	14	20.1	23	24	22	17	9	16	26.9	11	18.0	17	18	18	9	...	16	26.9	12	23.8	10	10	19	17	13
17	26.9	14	20.1	23	24	22	17	9	17	26.9	11	18.0	17	18	18	9	...	17	26.9	12	23.8	10	10	19	17	13
18	26.9	14	20.1	23	24	22	17	9	18	26.9	11	18.0	17	18	18	9	...	18	26.9	12	23.8	10	10	19	17	13
19	26.9	14	20.1	23	24	22	17	9	19	26.9	11	18.0	17	18	18	9	...	19	26.9	12	23.8	10	10	19	17	13
20	26.9	14	20.1	23	24	22	17	9	20	26.9	11	18.0	17	18	18	9	...	20	26.9	12	23.8	10	10	19	17	13
21	26.9	14	20.1	23	24	22	17	9	21	26.9	11	18.0	17	18	18	9	...	21	26.9	12	23.8	10	10	19	17	13
22	26.9	14	20.1	23	24	22	17	9	22	26.9	11	18.0	17	18	18	9	...	22	26.9	12	23.8	10	10	19	17	13
23	26.9	14	20.1	23	24	22	17	9	23	26.9	11	18.0	17	18	18	9	...	23	26.9	12	23.8	10	10	19	17	13
24	26.9	14	20.1	23	24	22	17	9	24	26.9	11	18.0	17	18	18	9	...	24	26.9	12	23.8	10	10	19	17	13

VK EAST - ASIA VK STH - ASIA VK WEST - ASIA

UTC	MUF	dBd	FOT	14.2	18.1	21.2	24.9	28.5	UTC	MUF	dBd	FOT	14.2	18.1	21.2	24.9	28.5	UTC	MUF	dBd	FOT	14.2	18.1	21.2	24.9	28.5
1 35.5	21	26.7	29	34	34	33	30		1 27.9	11	21.9	23	22	17	10			1 32.5	9	29.6	5	16	18	17	15	
2 34.8	21	26.2	29	34	34	33	29		2 27.7	12	20.9	20	23	22	17	10		2 34.8	8	25.7	5	16	18	18	15	
3 34.7	22	25.8	31	35	35	33	29		3 27.1	12	20.5	22	24	22	17	9		3 34.7	8	25.5	6	16	18	18	15	
4 34.7	22	25.8	31	35	35	33	29		4 26.9	12	20.5	22	24	22	17	9		4 34.7	8	25.5	6	16	18	18	15	
5 31.5	24	23.8	40	40	38	34	29		5 23.8	16	18.0	30	27	22	13	5		5 31.5	11	23.5	16	22	27	19	15	
6 29.9	27	21.9	49	45	41	35	28		6 21.9	10	15.9	38	29	20	8	-6		6 29.9	14	21.4	27	27	25	20	13	
7 26.9	30	19.5	49	44	38	31	23		7 24.9	9	15.9	38	29	20	8	-6		7 26.9	14	21.4	27	27	25	20	13	
8 22.1	32	16.7	48	41	34	25	15		8 15.9	26	12.0	32	17	3	-16	-38		8 21.5	21	16.2	37	30	22	12	0	
9 18.9	35	14.2	46	37	29	17	4		9 18.9	29	9.9	25	5	-13	-59	...		9 18.9	35	13.8	35	25	16	2	-12	
10 16.4	38	12.3	43	32	22	7	-7		10 11.0	35	8.2	16	-26	-34	...	...		10 16.4	38	11.2	32	20	15	-1	-32
11 14.4	40	10.8	40	27	14	-1	-18		11 11.0	35	8.2	16	-26	-34	...	...		11 14.4	40	10.8	32	20	15	-1	-32
12 13.3	41	9.5	38	23	9	-8	-27		12 11.0	35	8.2	16	-26	-34		12 13.3	41	9.5	35	7	18	-4	-25	
13 13.3	41	9.5	38	23	9	-8	-27		13 11.0	35	8.2	16	-26	-34		13 13.3	41	9.5	35	7	18	-4	-25	
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15 12.6	42	9.4	35	19	5	-14	-35		15 11.0	35	8.2	16	-26	-34		15 12.6	42	9.4	35	19	5	-14	-35	
16 11.7	45	8.5	31	12	-25		16 11.0	35	8.2	16	-26	-34		16 11.7	45	8.5	31	12	-25	
17 9.6	45	7.5	24	5	-16	...	...		17 7.6	37	5.8	-12	...	...	...	...		17 9.6	45	7.5	24	5	-16	...	...
18 9.3	45	7.2	22	0	-16	...	...		18 7.5	37	5.7	-12	...	...	...	...		18 9.3	45	7.2	22	0	-16	...	...
19 9.3	45	7.2	22	0	-16	...	...		19 7.5	37	5.7	-12	...	...	...	...		19 9.3	45	7.2	22	0	-16	...	...
20 21.0	36	10.3	36	30	21	10	-2		20 9.8	23	5.2	-4	-22	...	...	...		20 21.0	36	10.3	36	30	21	10	-2
21 28.6	25	22.0	37	37	35	31	25		21 14.1	17	10.8	17	5	-8	-28	...		21 28.6	25	22.0	37	37	35	31	25	
22 33.4	22	25.5	35	36	36	33	29		22 15.0	18	10.8	20	11	0	-13	...		22 33.4	22	25.5	35	36	36	33	29	
23 31.1	22	25.5	35	36	36	33	29		23 23.9	13	18.2	20	11	0	-13	...		23 31.1	22	25.5	35	36	36	33	29	
24 26.5	21	26.9	29	34	35	33	30		24 26.5	12	20.1	19	22	20	15	7		24 26.5	21	26.9	29	34	35	33	30	

HAMADS

TRADE HAMADS

● **AMIDON** ferromagnetic cores: for LUNFA/HF/LHF applications. Send DL size SASE for enquiries to RJ & US Imports, Box 431, Kiama NSW 2533 (no discount at office please... 14 Sydney Ave, Kiama). Agencies at: Geoff Wood Electronics, Sydney; Webb Electronics, Albany; Asstec TV Service, Hobart; Electronic Components, ACT; Truocott Electronics, Melbourne.

● **WEATHER FAX** programs for IBM XT/ATs. RADFAX2 is a high resolution 8/line weather fax, more & RTTY receiving program. Needs CGA, SGBI and RADFAX decoder. Also RF2HERC, RF2EGA and RF2VGA, same as RADFAX2 but suitable for Hercules, EGA and VGA cards respectively. \$35. SATFAX is a NOAA, Meteor and GMS weather satellite picture receiving program. Uses EGA or VGA modes. Needs EGA or VGA colour monitor and card, & Weather Fax PC card, and 137MHz receiver, \$45. All programs are on 5.25" or 3.5" disks (state which) & documentation, add \$3 postage. Only from M Delehanty, 42 Villiers St, New Farm, Qld 4005. Ph (07) 358 2785.

FOR SALE - NSW

● **REALISTIC** 10m SSB/CW transceiver, manual, mic, carton, HTX-100, 525 watts, \$200. VK2AJQ (075) 24 9772.

● **COMMUNICATIONS TOWER** 20m free-standing tilt over galvanneal tower CW Mosley beam KFAK400 radio \$2200. FL2100Z WARC linear 110W. TS600 6m transceiver \$350. All in G. VK2BKG QTHR.

● **YAESU FRG7000** com receiver, 250kHz-30MHz, digital, synthesised, 24hr digital clock and timer, see 8H020985, EC, handbook, \$325 one. Ken VK2ATK QTHR (02) 809 4000.

● **YAESU YD148** desk mic, used once, \$50. Merv VK2ZD QTHR (02) 427 3281.

● **TEN-TEC PARAGON** all mode tower WARC bands all filters & Tuner desk mic \$1700 one. Electronic moneyer (CAQ5) \$50. Paddle (CHROM) \$75. Keyer board asmb and tested \$65. Keyer \$45. Ben VK2ZD QTHR (047) 51 MC45 (1) MC46, make an offer. Ken VK2ZD QTHR (047) 54 2259 after 6pm.

● **ANTENNA TRIBAND HB33DX** 20m E70m, hardly used, \$350 one. Allan VK2FH QTHR (02) 969 8703.

● **TWO RF CONCEPTS** "fourth generation" solid state power amplifiers. They both feature state of the art Gas/FET preamps, variable SSB delay, high SWR protection, over temperature protection, automatic remote keying, and remote control. They both work with all modes of transmission including FM, CW and SSB. 143-148MHz, input 200W to 50 watts, output 170 watts, 430-450MHz, input 500W to 40 watts, output 100 watts. Brand new, \$695 ea. VK2KXQ QTHR (02) 371 0745.

● **YAESU FT101E**, GC, with spare tubes and manuals \$N531433, \$450 one. Phil VK2JR.

● **MFJ 1224** computer interface. Plug pack included. Wired to suit VIC20 at the moment. VIC20 software, \$150. Siemens M100 teleprinter (brown case) in VGC with RTTY mode 730/731, plus auto start. Modems and power supply completely installed, \$50. Tony VK2CAM (02) 638 3569.

● **FT101E**, GC, SNo 8F50137, operating manual and still in original carton, \$460. VK2MJJ QTHR (065) 25 4878.

● **CRO BWD** dual trace 538A, 10MHz BW TV triggering, CW two probes, handbook, in original carton, \$300 one. Lloyd VK2ELB QTHR (02) 639 7007.

● **ICOM IC651D** 100W 6m all-mode txv with matching IC-P20 power supply/speaker, Icom Mike, as new cost. \$750 or offer. Consider swap for HF txv in EC. Ian VK2JCW (02) 634 7210.

● **ICOM IC-25AT** 2M FM HI-hi complete unit in original box, almost new, 48 memories DTMF, still under warranty, \$470 one. Contact Asst VK2XVE (02) 313 6821.

● **COLLECTOR'S item** AWA AT 21 transmitter CW separate power supply. ATU built-in. VGC. Spare valves available. Offers to Alex VK2DV QTHR (065) 82 1301.

● **FTD-401** transceiver, new-driver and finals. Outboard speaker. No Mike. Complete with Ham-Preselector SX-59, \$400 one. Can be converted into a linear instman and carton. MFJ1224 com-

puter interface. Plug pack included. Wired to suit VIC20 at the moment. VIC20 software, \$150. Siemens M100 teleprinter (brown case) in VGC with RTTY mode 730/731 plus auto start. Modems and power supply completely installed \$50. Tony VK2CAM (02) 638 3569.

FOR SALE - VIC

● **ELECTRICAL & TELEPHONE** equipment, cable, tools, hardware and accessories GSA computer, drills, electrical test-ers, batteries and heaps of good bargains. Approx \$12,000 worth of goods must be sold. For inventory copy, please phone Evan VK3EJV (03) 438 2878 AH.

● **ICOM IC745** HF txv, all mode inc FM gen cov receiver, with ICOM desk mic, instr book etc. EC, \$1250. EAT-300 ATU, EC, \$150. Ron VK3OM QTHR (055) 44 3019.

● **SHACK CLEAN** Out fifty years. Some parts irreplaceable mine for hobbyist, home brewer, experimenter, some parts worth more than \$50 the lot. VK3ALN QTHR (03) 802 4155.

● **SOLAR BASIC** computer power regulator. Input 230vac 10 amp output, 115V AC 18 amps. VK3DBZ (03) 698 4082.

● **YAESU YD148** desk microphone, go!ball tie, \$50. Katsumi CW paddle keyer with memory, \$100. Also Chamside 10/15/20 vertical antennas, as new, \$90. Tom VK3NHY (03) 866 2356 or (03) 699 7200 (bus).

● **ICOM IC451E** all mode 70cm txv set no 1641 plus, 50W 70cm linear amplifier, both VGC, \$640. Also 70cm beam antenna \$30. Will not separate. Licensed amateurs only. VK3DVT (03) 592 6235.

● **TYPE 'S' HEAVY DUTY** power supply including leads and sockets and spare 880u \$30. Coils, all sizes, inc silver-plated AR7RX including all coil boxes, CW handbook, power supply modified for SSB use, \$35. AR7 dial mechanism \$10. PC, Hewlett Packard wave meter \$5 to 400MHz, \$16. Used power amplifier and power supplies low to high voltage, inc 2 neon 10-12 KVtXs. Commercial valve transceivers with transistor power supply and mic. Weston, Pye, Crammohd, Vintin, from \$17.50. Crystals 'D' type and FT243 plus miniature, \$1 ea. Some sets avail same size 100kHz, 500kHz and marker crystals, PMG key, 6.0MHz Xal filter, free switches, pots, IFA, audio TXs, radio etc, for wrecking, maps free to all buyers, reasonable offers accepted. Don VK3ADI BH (03) 882 020, (AH) 859 5595.

● **FT230R** 2 Mz FM TX/R mob and base, 10/25 watt, memories, rptr, offset, memory split and scan, full instr manual, mint horns and condx. VK3ALY QTHR (059) 41 1248.

● **RACKS** 19ins by 6ft with doors, 2 for \$35 each. One for \$45. Insulation tape decks, rack mounting, not going, half-inch 580, one-inch \$45. Many spares, info. Arnold VK3AGW (03) 754 4111 AH.

● **TONO** model 350 com/ma's computer, Moser, baud, ASCII, manual supplied, \$200, plus National DE printer LA100 8m model spare head ribbons and manual, \$200. Will QTHR (052) 43 5220 VK3CWW.

● **KENWOOD TS940S** has CW filters, voice synthesizer unit fitted with SP940 external speaker EC, \$3200 one. Phil VK3CDR (03) 726 9222 after 6pm.

FOR SALE - QLD

● **SHACK CLEAN** Out: old valves, test equipment, bits and pieces, send SAE with your wanted list and I will send list of items I have for sale. VK4DY QTHR.

● **YAESU FRG7** receiver, GC, 12/110vdt works great from 12/24 adaptor or mobile, \$200 one. Kenwood 120 transceiver 12V ideal for mobile. Cabinet, lab, works well though, \$450 one. Len VK4BH QTHR (077) 396 3650.

● **WORK THE WORLD** from the great DX position on hilltop, small cottage on 1/4-acre freehold block at Mount Lurcon, 20 mins Gladstone. Ideal for large antennas, HF and 2m antennas included, \$43,500. Roy VK4CAT (079) 75 1360.

● **THURRI** Hi-Gain 10/15/20m dB gain 25dB/FB beam. Offc VK44C/148 VHF 1/11-element beam 14.50dB gain. Geoff VK4ATQ (077) 23 1453 AH.

FOR SALE - SA

● **CLIPPERTON L** linear four 572B tubes, very little use, one owner from new, 1.8 to 30MHz including 10MHz option. John Ruston VK5ARK QTHR (085) 86 8127.

FOR SALE WA

● **FULL SIZE** 20m Hi-Gain beam, \$250. Transformer 5000v input 250v 2500/2500 CT current 2.5 amps \$150. Tested. VK8PT QTHR (08) 299 6741.

● **YAESU FT101Z** in VGC with hbook, mic and packing case. Very little used, \$400 one. Con VK6FM QTHR (087) 33 1978.

FOR SALE - TAS

● **FT101E** EC, new, finals plus spare pwr trans and box of bits from old FT101B, \$450. FRG-7 xtal fit \$300. FTV650 6M txv, IC202. Both small faults, \$60 ea. (052) 67 2356 AH.

● **YAESU FT-620** 6m txv, VGC, \$350. Damien VK7CDI (003) 95 4153.

● **FT7 GC** with mic and home brew pwr supply, \$350. FT-DX-100 with Yaeus desk mic, offer state late VK7NBC. Athol VK7UR QTHR (044) 24 2325.

WANTED - NSW

● **COLLING KWM42** or KWM-2A xcv, Collins S-Line. Details to VK2OE, PO Box 1914, Wollongong NSW 2500.

WANTED - VIC

● **PA3 DC-DC adaptor** for FT208R. Jack VK3LG QTHR (03) 807 2633.

● **WWII ARN-7** radio compass control box CA4AR-7 also front panel 22 pin female plug PL 122 FOR ABOVE. VK3DBZ (03) 698 4662.

● **ICOM txv IC735 IC751A** also ATU Icom AT150 AT500 mile Icom SM4 plus mobile tune ATU. Ken VK3MDF (H) (051) 52 3984, (W) (051) 52 3354.

● **COPY of operating manual** or similar information for Pye Ticever VK3PTV (03) 729 1513.

WANTED - QLD

● **2MTR FM TX/R**, prefer Kenwood TR7950 TM2570A TM2550 TM231A. Ph (071) 25 3415 or write Clarrie Stennett, 1/19 Linpus St, Harvey Bay 4655. Any reasonable price.

● **MEMORY UNIT** for Yaeus FT902D. ALAN VK4FVA QTHR (077) 75 2747.

● **AT130** Kenwood ATU. Geoff VK4CET. (077) 23 1453 AH.

● **COPY FRG-7 circuit diagram**. VK4BKM Keith (074) 86 4340 QTHR.

WANTED - TAS

● **HF Transceiver** with gen coverage receiver, prefer ICOM and in psu, (052) 67 2356 AH.

WANTED - WA

● **YAESU remote antenna selector**, FAS-1-4R Kenwood mobile bracket for TS120/130 MB100. VK6PY Paul QTHR (09) 275 1617.

● **INTRUDER WATCH** observer in VK6. Free tape, log, postage and advice. Please help. Contact Graham VK6AO QTHR (08) 451 3561.

● **VARIABLE CAPACITORS** around 200PF Command TX type etc. Also 1 and 2 gang old b'cast type around 385PF to suit antenna tuners. VK6ABS QTHR (090) 75 4136.

● **TOWER** 8m HIGH, preferably crank-up/roll-over type, to support 3-element 20m beam. Perth area, please. Steve VK6VZ (08) 349 9703.

Satellite Activity for February/March 1991

1. Launches

The following launching announcements have been received:

Int'l No	Satellite	Date	Launch Nation	Period min	Apog km	Prg km	Inc deg
1991-							
013A	COSMOS 2135	26 Feb	USSR	104.5	1034	953	82.8
014A	RADUGA 27	28 Feb	USSR	1396.0	34994		1.4
015B	MOP-2	02 Mar	ESA	1431.6	35963	35433	1.1
015A	ASTRA 1B	02 Mar	ESA	717.5	35853	4534	3.9
016A	COSMOS 2136	06 Mar	USSR	90.2	336	257	62.9
017A	USA 69	08 Mar	USA				
018A	IMMARSAT-2	08 Mar	USA				
019A	NADESHDA-3	12 Mar	USSR				
020A	PROGRESS M-7	19 Mar	USSR	88.4	230	190	51.6
021A	COSMOS 2137	19 Mar	USSR	94.0	495	448	65.8
022A	MOLNIYA 3-40	22 Mar	USSR	11h41m	39082	468	62.8

2. Returns

During the period 52 objects decayed, including the following satellites:

1981-100A	SME	05 Mar
1990-081B	PRC 31	11 Mar
1991-002A	PROGRESS M-6	15 Mar
1991-016A	COSMOS 2136	20 Mar
1991-004A	COCOS 2121	10 Feb

BOB ARNOLD VK3ZBB

Hamads

Please Note: If you are advertising items For Sale and Wanted please use a separate form for each. Include all details; eg Name, Address, Telephone Number (and STD code), on both forms. Please print copy for your Hamad as clearly as possible.

*Eight lines per issue free to all WIA members, ninth line for name and address. Commercial rates apply for non-members. Please enclose a mailing label from this magazine with your Hamad.

*Deceased Estates: The full Hamad will appear in AR, even if the ad is not fully radio equipment.

*Copy typed or in block letters to PO Box 300,

Cauffield South, Vic 3162, by the deadline as indicated on page 1 of each issue.

*QTHR means address is correct as set out in the WIA current Call Book.

*WIA policy recommends that Hamads include the serial number of all equipment offered for sale.

*Please enclose a self addressed stamped envelope if an acknowledgement is required that the Hamad has been received.

Ordinary Hamads submitted from members who are deemed to be in general electronics retail and wholesale distributive trades should be certified as referring only to private articles not being re-sold for merchandising purposes.

Conditions for commercial advertising are as follows: \$25.00 for four lines, plus \$2.25 per line (or part thereof) Minimum charge — \$25.00 pre-payable.

State:

Not for publication:

☐ Miscellaneous

☐ For Sale

☐ Wanted

Name: Call Sign: Address:

Solution to Morseword No 51

	1	2	3	4	5	6	7	8	9	10
1
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10

Across: 1 snag; 2 cage; 3 rile; 4 belt; 5 hare; 6 last; 7 entire; 8 cap; 9 said; 10 ripe
Down: 1 arid; 2 fax; 3 lied; 4 bib; 5 heir; 6 race; 7 onset; 8 grot; 9 there; 10 vase

HOW TO JOIN THE WIA

Fill out the following form and send to:

The Membership Secretary
Wireless Institute of Australia
PO Box 300
Caulfield South, Vic 3162

I wish to obtain further information
about the WIA.

Mr, Mrs, Miss, Ms:

Call Sign (if applicable):

Address:

State and Postcode:

TRADE PRACTICES ACT

It is impossible for us to ensure the advertisements submitted for publication comply with the Trade Practices Act 1974. Therefore advertisers and advertising agents will appreciate the absolute need for themselves to ensure that, the provisions of the Act are complied with strictly.

VICTORIAN CONSUMER AFFAIRS ACT

All advertisers are advised that advertisements containing only a PO Box number as the address cannot be accepted without the addition of the business address of the boxholder or seller of the goods.

TYPESETTING : Magazine Graphics
PO Box 72
Caulfield Sth, 3162
Ph: 399 9525

PRINTING: Rural Press
Gisborne

MAIL DISTRIBUTION: R L Polk &
Co Pty Ltd
PO Box 140,
Collingwood,
Vic. 3068
Tel:(03) 417 5161

The opinions expressed in this publication do not necessarily reflect the official view of the WIA, and the WIA cannot be held responsible for incorrect information published.

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WIA Slow Morse Transmissions

VK2BWI nightly at 2000 local on 3550 kHz

VK2RCW Continuous on 3699 kHz and 144.950 MHz
5 wpm, 8 wpm, 12 wpm

VK3RCW Continuous on 144.950 MHz 5 wpm, 10 wpm

VK4WIT Monday at 0930 UTC on 3535 kHz

VK4WII Tuesday at 0930 UTC on 3535 kHz

VK4WCH Wednesday at 0930 UTC on 3535 kHz

VK4WIS Nightly at 0900 UTC on 3542 kHz

VK5AWI Nightly at 1030 UTC on 3550 kHz

VK6RAP Nightly at 2000 local on 146.700 MHz

VK6WIA Nightly (except Saturday) at 1200 UTC on 3.555 MHz

WIA Divisional Bookshops

The following items are available from your Division's Bookshop
(see the WIA Division Directory on page 3 for the address of your Division)

	Ref	Price to Members		Ref	Price to Members
ANTENNA BOOKS			MISCELLANEOUS cont.		
Ant. Compendium Vol 2 Software only	BX293	\$18.00	Solid State Design - ARRL	BX171	\$21.60
Antenna Compendium Vol 1 ARRL	BX163	\$19.80	Spread Spectrum Source Book - ARRL	BX305	\$36.00
Antenna Compendium Vol 2 & Software ARRL	BX294	\$32.40			
Antenna Compendium Vol 2 ARRL	BX292	\$21.60	MORSE CODE		
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Antenna Impedance Matching - ARRL	BX257	\$27.00	Advanced Morse Tutor - 3.25 inch Disk	BX328	\$27.00
Antenna Meter Book W1FB - ARRL	BX179	\$18.00	Morse Code 2 Tapes Novice Code Course - Gordon West	BX228	\$17.91
Antenna Pattern Worksheets Pld of 10 - ARRL	BX211	\$5.40	Morse Code 6 Tapes 13-20 WPM Code Course - Gordon West	BX231	\$63.90
Antennas 2nd ed John Kraus	BX259	\$93.60	Morse Code 6 Tapes 5-13 WPM Code Course - Gordon West	BX230	\$63.90
Beam Antenna Handbook - New Ed. 1990 Orr	BX215	\$17.37	Morse Code 6 Tapes Novice Code Course - Gordon West	BX229	\$63.90
Cubical Quad Antennas - Orr	BX214	\$15.05	Morse Code Tapes Set 1: 1-5-10 WPM - ARRL	BX331	\$16.65
HF Antennas - Moxon RSGB	BX188	\$27.00	Morse Code Tapes Set 2: 10-15 WPM - ARRL	BX332	\$16.65
Novice Antenna Notebook DeMaw - ARRL	BX162	\$14.40	Morse Code Tapes Set 3: 15-22 WPM - ARRL	BX333	\$16.65
Practical Wire Antennas - RSGB	BX296	\$25.20	Morse Code Tapes Set 4: 13-14 WPM - ARRL	BX334	\$16.65
Reflections - Software 3 in disk	BX358	\$18.00	Morse Tutor 5.25 inch IBM Disk	BX187	\$18.00
Reflections - Transmission Lines The Book - ARRL	BX348	\$36.00			
Smith Chart Expanded Scale PK of 10	BX003	\$5.94	OPERATING		
Smith Charts Stand Scale SET Co-ord. PK of 10	BX000	\$5.94	Amateur Radio Awards Book - RSGB	BX297	\$27.00
The Antenna Handbook - ARRL	BX161	\$32.40	CXCC Companion	BX345	\$10.80
The Truth About CB Antennas - Orr	BX219	\$15.57	Low Band DXing - John Devolere	BX195	\$18.00
Transmission Line Transformers - ARRL	BX329	\$36.00	Maidenhead Locator-Grid Atlas - ARRL	BX197	\$9.00
Vertical Antenna Handbook - Lee	BX284	\$16.65	Prefix Map: The World Atlas on Heavy Paper	BX335	\$14.40
Vertical Antennas - Orr	BX220	\$14.27	Prefix Map of North America	BX235	\$7.20
Yagi Antenna Design - ARRL	BX164	\$27.00	Prefix Map of The World	BX234	\$7.20
			Radio Amateurs World Map	BX236	\$7.20
			The Complete Dotor - Bob Locher	BX194	\$18.00
			Transmitter Hunting - TAB	BX222	\$32.31
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The ATV Compendium - BATC	BX270	\$15.75	AX.25 Link Layer Protocol - ARRL	BX178	\$14.40
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			Computer Networking Con (Packet) 1-4 1982/5	BX166	\$32.40
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			Packet Radio Made Easy - Rogers	MFJ32	\$18.45
			Packet Users Notebook - Rogers	BX285	\$16.65
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Radio Call Book Supplements 1991 Due June	BX364	\$15.75	Satellite AMSAT-NA 5th Symposium 1987 - ARRL	BX182	\$15.75
			Satellite AMSAT-NA 6th Symposium - ARRL	BX189	\$15.75
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SOS At Midnight - ARRL	BX209	\$9.45	Microwave Update Con. 1989 - ARRL	BX321	\$21.60
Space Almanac - ARRL	BX299	\$36.00	Mid Atlantic VHF Con. October 1987 - ARRL	BX175	\$15.75
			UHF Compendium Part 1 & 2 Vol 1	BX250	\$44.96
			UHF Compendium Part 3 & 4 Vol 2	BX251	\$44.96
			UHF Compendium Part 5 German only	BX354	\$44.96
			UHF/Microwave Experimenters Manual - ARRL	BX325	\$36.00
			UHF/Microwave Experimenters Software 5 inch Disk - ARRL	BX327	\$18.00
			VHF 21st Central States Con. 1987 - ARRL	BX172	\$15.75
			VHF 22nd Central States Con. 1988 - ARRL	BX173	\$15.75
			VHF 23rd Central States Con. 1989 - ARRL	BX286	\$15.75
			VHF 24th Central States Con. 1990 - ARRL	BX322	\$21.60
			VHF/UHF Manual - RSGB	BX267	\$43.20
HANDBOOKS					
1991 ARRL Handbook	BX337	\$47.61	WIA MEMBERS SUNDRIES		
Electronics Data Book - ARRL	BX201	\$21.60	Log Book Covers		\$16.00
Motorola RF Device Data - 2 Volumes	BX47	\$22.05	WIA Badge - Diamond		\$4.00
Operating Manual - ARRL	BX192	\$27.00	WIA Badge - Diamond with Call Sign Space		\$4.00
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Radio Handbook 23rd edition - Bill Orr	BX224	\$53.91	WIA Tape - Sounds of Amateur Radio		\$7.00
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			WIA PUBLICATIONS		
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QRP Note Book - DeMaw ARRL	BX170	\$10.80			
Radio Astronomy 2nd edition - John D Kraus	BX202	\$22.50			
Short Wave Propagation Handbook	BX258	\$16.65			
Shortwave Receivers Past and Present	BX253	\$15.84			

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If the item is carried by your Divisional Bookshop, but is not in stock, your order will be taken and filled as soon as practicable.

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